

FLIGHT

The
AIRCRAFT ENGINEER
AND AIRSHIPS

First Aeronautical Weekly in the World. Founded January, 1909

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice and Progress of Aerial Locomotion and Transport
OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 1314. (Vol. XXVI.) 26th Year.
No. 9.

MARCH 1, 1934

Weekly, Price 6d.
Post Free, 7½d. Abroad, 8d.

Editorial Offices: 36, GREAT QUEEN STREET, KINGSWAY, W.C.2
Telephone (2 lines), Holborn 3211 and 1884.
Telegrams: Truditur, Westcent, London.

Subscription Rates, Post Free.

UNITED KINGDOM			OTHER COUNTRIES		
	s.	d.		s.	d.
3 Months	8	3	3 Months	8	9
6 "	16	6	6 "	17	6
12 "	33	0	12 "	35	0

CONTENTS

Editorial Comment:					
A Rail and Air Combine	..	..	..	..	185
Lindbergh's Survey Flight	..	..	..	..	187
The Royal Aero Club and Women	..	..	..	..	188
Air Transport and Commerce: The Douglas C.D.I.	..	..	..	..	189
De Havilland Express	..	..	..	..	192
From the Clubs	..	..	..	..	193
A New British Klemm	..	..	..	..	195
Airport News	..	..	..	..	198
Airisms from the Four Winds	..	..	..	..	199
New Aircraft	..	..	..	..	201
Cloud Flying	..	..	..	..	203
The Industry	..	..	..	..	205
Royal Air Force	..	..	..	..	207
Air Post Stamps	..	..	..	..	208

INDEX FOR VOL. XXV.

The 8-page Index for Vol. XXV of "Flight" and "The Aircraft Engineer," January to December, 1933 (with over 7024 references for "Flight" and 197 references for "The Aircraft Engineer"—7221 in all), is now ready and can be obtained from the Publishers, 36, Great Queen Street, Kingsway, W.C.2, price 1s. per copy (1s. 1d. post free).

EDITORIAL COMMENT



OME time ago the Railway Companies provided themselves with legal powers to use air transport. They had experienced a sharp shock from the competition of the road, and they did not want to see the experience repeated. Their wisdom was generally applauded, and the Great Western's use of air transport in the West Country was also well received. Now comes the announcement of the formation of a new company by the four main railway companies, in conjunction with Imperial Airways. This has created something like consternation in the aeronautical world.

A Rail and Air Combine

We must consider the position dispassionately, remembering that the great desideratum is the development of air transport. It is not altogether easy to be dispassionate, for our sympathies, naturally, turn to the private companies which, with no subsidy from the State, have made such gallant efforts, and such successful efforts in several cases, to operate air services inside the British Isles. The success of such enterprises as Hillman's lines to Paris and in the south-east counties, of the Jersey Air Lines, of the Isle of Man lines, of the ferry services across the Humber by the North Sea firm, and across the Bristol Channel by Norman Edgar, and of the Midland and Scottish company, have aroused general admiration and sympathy. To these firms there can be no doubt that the formation of the new company, with huge resources behind it, may be a very serious menace. The speech of Sir Josiah Stamp at the general meeting of the London Midland & Scottish

DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

1934.					
Mar.	1.	"Speed and the Economics of Air Transport," Lecture by Maj. F. M. Green before R.Ae.S.			
Mar.	2.	Norfolk and Norwich Ae.C. Annual Dinner and Dance, Arlington Rooms, Norwich.			
Mar.	6.	"Relation of the Molecular Structure of Fuels to Their Behaviour in Diesel Engines." Lecture by G. D. Boerlage before R.Ae.S.			
Mar.	10.	Lloyd's Register Annual Reunion Dinner, May Fair Hotel.			
Mar.	15.	"Some Developments in Aircraft Construction." Lecture by H. J. Pollard before R.Ae.S.			
Mar.	21.	"Some Problems of a Technical Service." Lecture by Wing Com. G. W. Williamson, before R.U.S.I.			
Mar.	24.	Services Rugby: R.A.F. v. Army, at Twickenham.			
Mar.	28.	Royal Aero Club Annual General Meeting.			
Apr.	5.	"Engines." Lecture by Capt. A. G. Forsyth before R.Ae.S.			
Apr.	12.	"Speed and the Future of Commercial Aircraft." Lecture by M. Louis Breguet before R.Ae.S.			
Apr.	26.	"Landing in Fog." Lecture by Dr. Rüd Stüssel before R.Ae.S.			
Apr. 27-May 6.		International Aero Show, Geneva.			
May		Wilbur Wright Memorial Lecture, before R.Ae.S.			
May 17-June 2.		Royal Tournament, Olympia.			
May	21.	Guild of Air Pilots Garden Party.			
May	26.	Heston Air Navigation Trials.			
May	27.	Deutsch de la Meurthe Cup.			
June	1.	Entries close at 12 noon for London-Melbourne Race.			
June	2.	Brooklands Air Race Meeting.			
June	3.	London Aeroplane Club Garden Party, Hatfield.			
June	9.	Reading Ae.C. Annual "At Home."			
June	16.	R.A.F. Reserve Flying Club Annual Flying Display, Hatfield.			
June	23.	Lancashire Ae.C. Air Display, Woodford.			
June	30.	Royal Air Force Display, Hendon.			
July 13-14.		King's Cup Race.			

Railway Company (which is quoted on another page) was distinctly bellicose. The railway companies, still sore from their battle with road transport, are prepared to fight any rivalry from the air. They will use the air to fight the air, and the might of Imperial Airways is being called in to attack the unsubsidised companies. The combat is unequal. Fortunately, some of the new companies have achieved sufficient success to have gained a "good-will" which is a distinct asset, and may help them much in future developments.

Despite our sympathy for the enterprising private firms, we must look ahead and try to estimate whether the new development will be for the ultimate good or harm of internal air transport. If the new company formed by the railways with the help of Imperial Airways uses its full strength to kill air transport in these islands, he would be a bold man who would deny its power to do so. That is a terrible danger, and if the railways lay themselves out to do this, then the formation of this new company is the heaviest blow ever struck at inland air transport. The question is: Will the railways want to kill air transport?

We do not look for altruism from any party. All will consider their own interests. We must admit that the railways are within their rights not to risk the chances of a new attack upon their interests. In deciding to avert this by using air transport themselves, they are certainly wise to make use of the experience of Imperial Airways. A wise general always masses strength at the critical point, and commercial battles are not fought out on the principle of *XI a side*. Imperial Airways, too, are quite right to earn money when they can. We grant that a State subsidy has enabled them to acquire their unrivalled experience in the management of commercial air lines, but still the experience is there to be used. The subsidy pays for their losses on Empire routes. Their services to the railways will presumably be pure profit. It is to the advantage of the taxpayer that Imperial Airways should earn profits.

The matter, therefore, comes to this. Will the railways want to kill inland airways, or will they see in them a source of future profit and so run them for their own benefit? The object of the railways will always be dividends for their shareholders. As a step towards earning profits, they must also consider their own reputations, and must sometimes run branches (whether by rail, road or air) which will not pay directly but will be a convenience to their passengers and consignors. It has been said, perhaps justly, that before the advent of road competition the railways were not sufficiently alive to this consideration. They were said to take up the haughty attitude of monopolists. It is only reasonable to suppose that the attack on their monopoly by road transport has taught them a lesson, and shown them the folly of that attitude. In fact the formation of this company to run air lines is itself evidence of their awakening and their new frame of mind. The opening of the West Country route, which admittedly has not paid, by the Great Western, is further evidence pointing in the same direction.

In fact, if airways can be made to pay on their merits, there can be no reasonable doubt that the railways will be not only ready but anxious to use them and develop them. We are certainly approaching the time when airways can be made to pay, and in fact the experience of some of the unsubsidised

lines which we have mentioned shows that a profit is even now possible. We may take it as certain that ferry services across stretches of water will be not only maintained, but multiplied. When we come to trunk routes, such as between London and Edinburgh, it has been suggested that as the trains must continue to run, the companies will want to keep the passengers in the trains and will disregard any demands for quick air transport even from a public which has grown very air-minded, and even though the airways might show an independent profit. Against that argument we may reflect that railways, it is commonly believed, lose on every first-class passenger carried, and yet are obliged to retain first-class carriages. If most first-class passengers and all first-class mail were to go by air, the railways could effect savings on their rail traffic. Lighter loads on the trains would mean less expenditure on engines and permanent way. We may remember the words of the late Sir Alfred Yarrow, who said that if airships became a success the shipping companies would not suffer. They would save by building no more extra-fast Atlantic liners, for all expensive cargoes (passengers, mails, etc.) would go by air, while the rest would be carried in cheap slow steamers. The same is likely to happen when rail and air work in conjunction. The third-class passengers might suffer at first, but we are considering the interests of airways primarily, and perhaps in time air travel will come within the means of even third-class passengers. In fact, we think it fairly certain that if airways can be made to pay, the railways would develop them rather than abolish them.

We must also consider the effects of any new development on the aircraft trade, as its health is a matter of public importance. Speaking generally, competition among several operators of aircraft is better for the trade than dealing with a single monopolist customer. There are, however, some consoling considerations on the other side. In the near future there will almost certainly be some new orders, for the types used by Imperial Airways for service on Empire routes will not be suitable for inland air lines. It is not to be expected that every unsubsidised company which starts an air service will make good, and if one fails, then there will be no more orders from that source. A customer, with the tremendous backing which this new company will have, will make for stability, always taking it that the railways really do develop air transport and do not merely intend to kill it. If that condition is fulfilled, then there is at least a very good chance of internal air lines expanding steadily and healthily with a minimum of setbacks. In that case, the aeroplane would always be put to do work where it could do itself most justice. That in itself would do much to encourage the public to trust it, which, again, would mean an increase in the number of air journeys and so in the number of aircraft ordered.

In this latest development we see the greatest possibilities of evil and likewise great possibilities of good to air interests. Which way the balance will turn depends on how the railway companies treat the new powers which have been put into their hands. We repeat that we look for no altruism. The railways will recognise no duty to develop airways for the good of the nation. They will regard them merely as possible revenue earners or the reverse. We must hope that they will welcome them as allies, and that the value of aircraft will be recognised by their new masters.

LINDBERGH'S SURVEY FLIGHT

The Equipment of the Lockheed "Sirius"

It is a curious fact that often some of the finest long-distance flights, and by "finest" we mean those which are of the greatest value to aviation, are given scanty publicity. Such a flight was that made by Col. and Mrs. Charles A. Lindbergh, which began on July 9 and ended on December 19, 1933, the log of which is given below. Although unheralded by advance publicity, the flight was very thoroughly planned and experience gained in previous long-distance flights applied to the selection of equipment. The primary object of the flight was to gather information regarding possible routes for an air service between the American continent and Europe. Col. Lindbergh, it will be remembered, acts as technical adviser to Pan-American Airways. We have to thank our American contemporary *Aviation* for the following details regarding the equipment, etc., of the Lockheed "Sirius" used on this flight.

In the Labrador-Greenland-Iceland area, the Danish steamship *Jellinge*, chartered by Pan-American Airways, co-operated with the Lindberghs and provided supplies at Halifax, St. Johns Cartwright, Iceland, and Greenland, and from the time the seaplane left North Haven until it had almost reached Europe, radio communication was maintained between it and the ship.

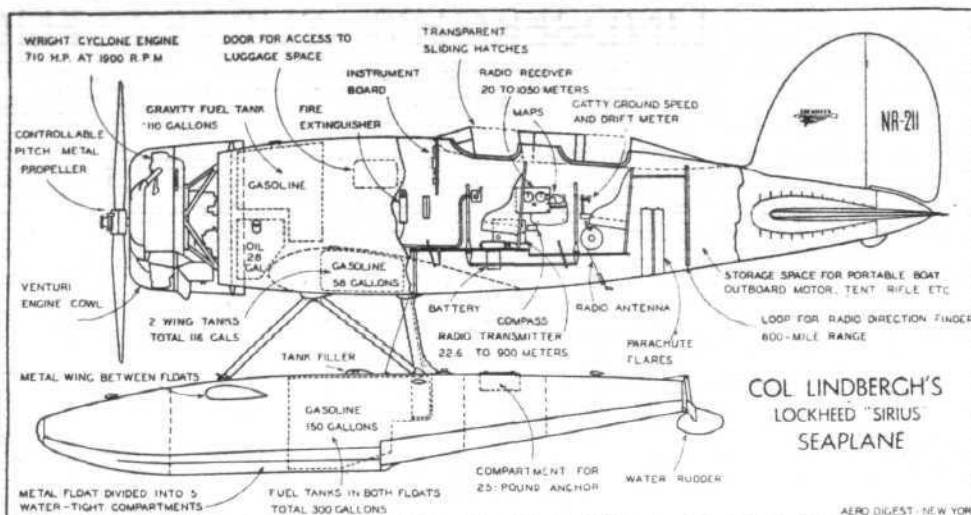
The aircraft used by the Lindberghs was a Lockheed "Sirius" monoplane, named the *Tingmisaq*, a Greenland Eskimo word which means "A man who flies like a big bird." A Wright "Cyclone," SR-1820-F2, direct drive radial air-cooled engine, giving 710 h.p. at 1,900 r.p.m., was fitted. Usually the operating speed of the engine was about 1,425 r.p.m., which gave the seaplane a cruising speed of 103 knots (118 m.p.h.). At this speed the consumption was 25 gallons per hour. On some stretches of the flight, as for example the trans-Atlantic crossing, the engine was run at 1,250-1,390 r.p.m. with a consumption of 21 gallons per hour. When loaded with 440 gallons of fuel the range of the aircraft, at 118 m.p.h., was 2,100 miles. Actually a top speed of 185 m.p.h. and a cruising speed of 150 m.p.h. at 1,700 r.p.m. was obtainable. The airscrew was a Hamilton Standard controllable-pitch type, with a diameter of 10 ft., the blade settings ranging from 18½ deg. to 22½ deg. Edo floats, fitted with special fuel tanks of 160 gallons capacity each, which were normally rated for a maximum gross weight of 6,400 lb. at 90 per cent. reserve buoyancy, were fitted. The following weights of the aircraft,

July	Mileage		Sept.	Mileage	
9	350	New York to South Warren, Me. (near North Haven).	4	345	To Stockholm.
11	200	To Halifax, N. S.	20	255	To Helsingfors, Finland.
12	550	To St. Johns, N. F.	22	200	To Leningrad, Russia.
14	515	To Cartwright, Labrador.	25	400	To Moscow.
17	250	Over Northwest River—exploration.	29	550	To Tallinn, Estonia.
21	300	Cartwright to Hopedale, Labrador (indirect).	Oct.		
21	200	To Hebron, Labrador.	1	500	To Oslo, Norway.
22	650	To Godthaab, Greenland.	3	200	To Stavanger.
25	350	To Holstenborg, Greenland (via Mt. Evans).	4	700	To Southampton, England.
27	300	Holstenborg to Mt. Evans over Inland Ice.	23	380	To Galway, Irish Free State.
30	600	Holstenborg to Lat. 70 deg. 10 min. N. and return.	25	450	To Inverness, Scotland.
Aug.			27	200	To Paris.
3	600	Holstenborg to Baffin Land and return.	Nov.		
4	1,200	Holstenborg over Greenland Ice Cap to Scoresby Sund and Ella Island.	2	276	To Amsterdam.
5	150	Ella Island to Clavering Island.	8	400	To Geneva.
6	900	To Angmagssalik.	11	600	To Santona, Spain.
8	450	To Godthaab.	13	250	To Caldelas de Tuy (Vigo).
8	350	To Julianehaab.	15	250	To Lisbon.
12	600	To Angmagssalik.	21	1,020	To Horta, Azores.
15	700	To Reykjavik, Iceland.	23	180	To Ponta Delgada, Azores.
22	600	To North, East, South coasts of Iceland.	24	1,100	To Las Palmas, Canary Island.
23	345	Iceland to Faroe Islands.	26	300	To Villa Cisneros, Africa.
24	200	To Shetland Islands.	27	790	To Porto Praia, Cape Verde.
26	600	To Copenhagen.	30	400	To Bathurst, Gambia.
			Dec.		
			6	1,834	To Natal, Brazil.
			8	1,094	To Para, Brazil.
			9	929	To Manaus, Brazil.
			12	950	To Port of Spain, Trinidad.
			14	752	To San Juan, Porto Rico.
			15	255	To San Pedro de Macoris, D. S.
			16	961	To Miami, Fla.
			18	500	To Charleston, S. C.
			19	600	To New York.



LINDBERGH'S SURVEY FLIGHT: Map showing the route followed throughout the tour and, above, the log day by day.

THE LAYOUT OF THE TINGMISSARTOQ: This diagram shows the disposition of the equipment, etc., of Lindbergh's Lockheed "Sirius."



obtained on the return from the flight, may be of interest. The weight empty, including equipment, was 4,589 lb., the weight of Col. and Mrs. Lindbergh was 280 lb., miscellaneous baggage 75 lb., oil 150 lb., and fuel 2,653 lb. With a wing area of 265 sq. ft., a wing loading of 29 lb. per sq. ft. and a power loading of 10.85 lb./h.p. were obtained.

As the itinerary of the flight included points south of the Equator and above 73 deg. lat. North, a large variety of equipment was necessary, and the neat stowage of this in the aeroplane was a real achievement. A collapsible boat with sail, oars, a 12-ft. mast, drinking water, food for one month and a waterproof cover to keep the occupants and equipment dry, was carried in the aeroplane. Arctic clothing, a month's supply of food, rifle, pistol, ammunition, fishing gear, etc., were carried in a sledge nearly 11 ft. long, weighing 49½ lb., which was stowed in the machine, partly dismantled so that the parts could be lashed together with leather thongs. Two water recovery devices similar to those used in airships to reclaim moisture by condensation from the engine exhaust gas were included, the moisture from the human breath being converted into water. An exceptionally complete range of instruments was provided. This included a standard 3-in. aperiodic magnetic compass which could be used

from either cockpit, a Gatty ground speed and drift indicator, a smaller spherical magnetic compass, and a directional gyro which proved of great use in latitudes near the magnetic pole, where variation changed rapidly and where the magnetic force was weak. A very wide selection of maps from a variety of sources and two radio sets developed by Pan-American Airways were carried. The main set weighed 62 lb. and gave very excellent results. All sending and receiving work was done by Mrs. Lindbergh. The auxiliary set was similar to that which has been developed by Pan-American Airways for use in the event of forced landings in South American jungles, and which may be dropped by parachute to unfortunates on the ground.

The *Tingmissartog* and its equipment was recently presented to the American Museum of National History.

THE ROYAL AERO CLUB AND WOMEN

FOR some reason the private discussion following the House Dinner at the Royal Aero Club on Tuesday, February 20, was widely reported in the daily Press. Unfortunately, some of these reports gave an entirely erroneous impression of the proceedings.

Therefore, as the official organ of the Royal Aero Club, we place on record the true facts.

The debate following the dinner was not in any way a meeting of members to decide upon any points, it was merely held to test the feeling of members with regard to the privileges enjoyed by lady members of the Club.

At the present time they have equal facilities with men members for participating in the help offered to pilots in many directions, as, for example, touring. They have also equal rights with regard to serving on committees controlling the sport side of flying, and there has been no question of depriving them of these rights.

They have, however, no privileges extending to the use of the social amenities of the club premises in London, other than as visitors, in the guest rooms.

The meeting decided, by a large majority, in favour of Mr. Alan Goodfellow's suggestion that there should be no question of extending the existing privileges.

The speakers in favour of extension were led by Mr. Handley Page, who treated the subject with a levity hardly consistent with its importance, and it was noticeable that the members in favour of extension were, for the most part, not those who used the club regularly. Mr. Goodfellow, on the other hand, produced a number of well-reasoned arguments and cold facts supporting his contention, not only that the step suggested would be against the desires of the majority of members, but also that for many other reasons, such as accommodation and so on, it was quite impracticable.

Fokker goes metallic

MR. ANTHONY FOKKER, who, for about twenty-three years has continually produced aircraft of mixed construction, and whose aircraft have probably been copied more than any others, in practically every country, has acquired the building and selling rights for the whole of Europe, excluding Russia, of the Douglas D.C.I. monoplane, which is of all-metal construction. It seems that the main reasons for Fokker's retention of the composite system of construction for so many years are that this system is easily adapted to the construction of new types, and that changes of existing aircraft can be effected in a short space of time at comparatively low cost. In instances where a certain type of aircraft is produced only in small quantities, mixed construction has proved itself to be of particular value, and this partly accounts for the extremely wide range of Fokker aircraft of various types scattered over the world to-day. For six years Fokker has studied the develop-

ment of all-metal aircraft, and has noted that, as the result of continual changing of basic design of all-metal aircraft, profits have suffered very heavily. Now that metal construction has run into steadier channels, and production methods and materials have been developed with a view to reducing manufacturing costs, Fokker considers himself justified in producing all-metal aircraft. The Douglas system of construction entails the use of duralumin and not high tension steels, and the development of the D.C.I. entailed such expense that very few, if any, European constructor could have afforded it. Nederlandsche Vliegtuigenfabriek Fokker will construct no all-metal machines of its own design, and will not entirely forsake the old system of mixed construction. Considering the adoption, by agreement or otherwise, of Fokker designs throughout the world, Fokker thinks that it will not be detrimental to his name or reputation if he buys the licence to build an aircraft of proven worth designed by another company.

Air Transport & Commerce

THE DOUGLAS D.C.1

A FLEET of twenty Douglas D.C.1 fourteen-passenger monoplanes is under construction for Transcontinental & Western Air, for use on the New York-Los Angeles service. The D.C.1 is a twin-engined low-wing cantilever monoplane of metal construction, carrying from 14 to 18 passengers.

The low cantilever wing of the D.C.1 is tapered both in plan and thickness. It is of cellular multi-web construction, with smooth riveted skin covering. The chord varies from 170 in. at the root, where the aerofoil section is N.A.C.A. 2215, to 68 in. at the tip, where the aerofoil section is N.A.C.A. 2209. Alclad 24 S.R.T. is the chief material employed. This is a new extra light aluminium alloy having a thin coating of pure aluminium to give it high resistance to corrosion. A centre section which runs beneath the fuselage carries the two engine nacelles, the retractable landing gear and the fuel tanks. The attachment of the outer planes to the centre section in the case of this stressed skin wing, consists of a bolted flange running completely round the aerofoil. The ailerons are of metal construction, covered with fabric, and have trailing edge "tabs" which relieve the pilot of any load on the control wheel caused by con-

DOUGLAS D.C.1

Two Wright "Cyclone" or Pratt and Whitney "Hornet" Engines

Dimensions

Length	62 ft.
Span	85 ft.
Height	16 ft.
Wing area	940 sq. ft.
Track	18 ft.
Airscrew diameter	11½ ft.
Total volume, passenger cabin ..	858 cub. ft.
Length of cabin	26 ft. 4 in.
Width of cabin	5 ft. 6 in.
Height of cabin	6 ft. 3 in.
Total volume of mail and cargo department	188 cub. ft.

Weights

	14 passengers	18 passengers
	Lb.	Lb.
Weight empty ..	11,875	12,080
Disposable load ..	6,125	5,920
Gross weight ..	18,000	18,000

Performance: with "Cyclone" or "Hornet" engines based on 18,000 lb. gross weight and guaranteed within 2 per cent. Airscrews set for best cruising speed.

Maximum speed	205 m.p.h.
Cruising speed at 75 per cent. power	196 m.p.h.
Cruising speed at 62.5 per cent. power	183 m.p.h.
Landing speed	61 m.p.h.
Maximum rate of climb	1,100 ft./min.
Service ceiling	23,000 ft.
Absolute ceiling	24,500 ft.
Service ceiling on one engine ..	5,800 ft.
Absolute ceiling on one engine ..	10,000 ft.
Maximum speed with airscrews set for best high speed	210 m.p.h.

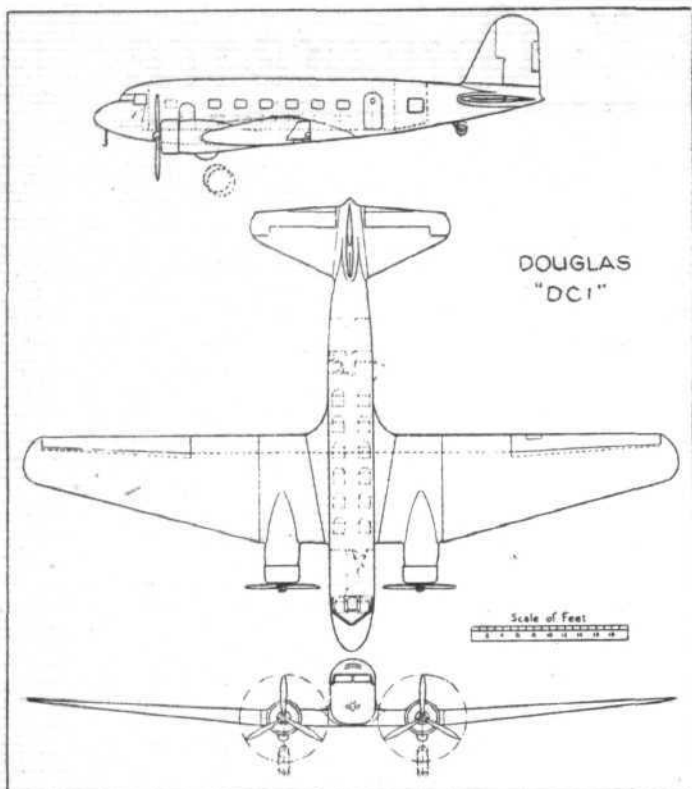
ditions affecting lateral stability. Split trailing edge flaps are built into the lower side of the wing and continue beneath the fuselage from aileron to aileron. When fully lowered, they increase the lift by 35 per cent. and the drag by 300 per cent. The reduction in landing speed is approximately 10 m.p.h. The ailerons remain positive in action and are effective beyond the stalling point of the wing; the flap gear is operated by a hydraulic system controlled from the cockpit.

The fuselage is of semi-monocoque construction with smooth riveted skin. Alclad 24 S.R.T. is used throughout. The entire interior from nose to tail is accessible, a hinged cover gives entrance to the nose compartment for access to the back of the instrument board, hydraulic brake cylinders, etc., while the floor of the passenger cabin, which is covered with a waterproof material, is removable for inspection of the control cables below. Aft of the rear baggage compartment is a door leading to the interior of the tail.

Air flow over the *empennage*, which is built integral with the fuselage, is smooth owing to the provision of large fillets terminating in a cone which carries the tail light and trailing radio antenna. Both the fin and tail plane are fixed, trim being obtained by means of "tabs" on the rudder and elevators. The landing gear is in two independent units which retract upward and forward into the engine nacelles. Each wheel is



A Douglas D.C.1 "Transport" as supplied to Transcontinental & Western Air, Inc.



carried in a fork member in a pair of hydraulic shock absorber struts. A hydraulic pump accessible to either the pilot or his assistant, raises the gear in 25 sec. and lowers it in 20 sec. Differentially controlled hydraulic brakes are fitted, and the brake operation remains positive with the wheels in the retracted position. As the axles come up against pillow blocks built into the nacelle structure, the aircraft may be landed on its wheels, which protrude approximately 9½ in. below the nacelles, with gear retracted; only the airscrew tips would suffer damage. As the wheels, when in the retracted position, are even further forward of the centre of gravity than when they are extended, there is no tendency for the machine to nose over during a landing. The tail wheel is provided with a hydraulic shock absorber and a swivelling lock which keeps it aligned during flight.

The D.C.1 is equipped with two engines of approximately 700 h.p. Either the Wright "Cyclone" (710 h.p. at 1,950 r.p.m. at 7,000 ft. geared 16-11) or the Pratt & Whitney "Hornet" (700 h.p. at 2,150 r.p.m. at 6,500 ft. geared 3-2) may be fitted. Both engines use fuel of 87 octane rating. Each engine mounting, which is constructed of chrome molybdenum steel tubing, is a separate quickly detachable unit. All connections are broken and joined at the fireproof bulkhead with quickly detachable plugs or fittings.

Port and starboard engine mountings are interchangeable. The engines are cowled with a three-piece N.A.C.A. cowl ring and the rear cowl of the nacelle is carefully faired into the wing. The adjustment of the engine mountings to the fireproof bulkheads is made through rubber bushings which greatly reduce the transmission of vibration to the rest of the aircraft. The exhaust collector outlets are below the wing to shield the cabin from noise and glare. Hamilton standard three-bladed, two position, controllable pitch airscrews are fitted. There are two main fuel tanks of 180 gallons capacity each and two auxiliary tanks of 70 gallons capacity each, making a total of 500 gallons maximum fuel supply. The main tanks are fitted with simultaneously opening dump valves controlled from the pilot's cockpit. After opening these valves, the pilot may watch the fuel gauge and close the valves again at will, thus discharging any desired amount of fuel. A carburettor air intake "preheater" which has a capacity sufficient to prevent the freezing of the carburettor during the coldest weather is fitted with a control valve and thermometer located in the cockpit. A pressure fire extinguisher system with a selector valve in the cockpit serves each engine.

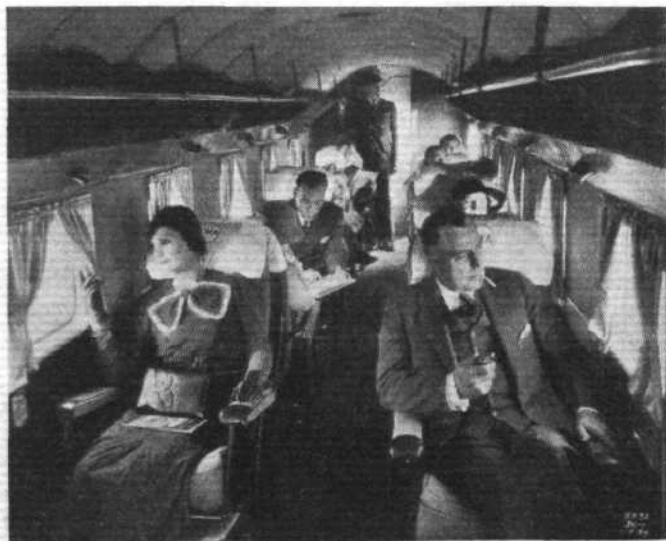
The cabin is 26 ft. 4 in. long, 5 ft. 6 in. wide and 6 ft. 3 in. high, and the entire length of the floor is free from structural obstacles. Normally the cabin is fitted to accom-

modate fourteen passengers in two rows of chairs spaced 40 in. apart and separated by a 16-in. central aisle. The chairs are adjustable for reclining or for reversing to face the passenger behind. Eighteen passengers may be carried with a slight reduction in the spacing of chairs and cargo space. Each seat has a separate window. Individual furnishings for each passenger include reading lamp, ash-tray, magazine pocket, lunch tray, call button and ventilation control. The reading lamp is located in such a position that its light is directed over the shoulder of the user without annoyance to any other passenger. A hat rack is installed along each side of the cabin above the windows, with a hand rail for passing up and down the aisle. Dome lights are provided for general illumination. Passengers enter the cabin through a large door on the port side of the fuselage and an emergency exit is provided on the starboard side. The mail loading door in the forward companionway may also be used. Under the direction of the Sperry Gyroscope Co. the cabin noise has been reduced to below 70 decibels above 1 millibar at cruising speed. It may be of interest here to give the following round figures (decibels above 1 millibar) for varying conditions.

		Cabin Saloon		
		Sea-level	8,000 ft.	14,000 ft.
Cruising, 75 per cent. power ..	..	71	71	69
Cruising, 62.5 per cent. power ..	..	69	69	67

		Pilot's Compartment		
Cruising, 75 per cent. power ..	..	86	86	84
Cruising, 62.5 per cent. power ..	..	84	84	82

A ventilating and steam heating system is provided. Air is admitted through a vent in the nose of the fuselage and is transmitted through ducts to the pilots' and passengers' compartments and to the lavatory. The system permits the entire air content of the cabin to be changed each minute, and a thermostat maintains the temperature at 70 deg. F. even when the outside air temperature is as low as 20 deg. below zero. The air is heated by passing it through the radiator under the floor served by steam pipes from a boiler installed in the port engine exhaust collector. This method of ventilation and heat control eliminates all possibility of noxious engine gases entering the ventilation system. Aft of the main door is a complete service buffet with drinking cups, built-in dry ice refrigerator and all facilities for serving meals while in flight. A lavatory is on the starboard side of the fuselage. A cargo compartment with a mail capacity of 1,000 lb. (76 cu. ft.) is just forward of the cabin on the starboard side of the fuselage. The door of this compartment opens into a companionway running along the port side of the fuselage between the pilot's cockpit and the cabin. The cargo is loaded through a special outside door provided in the left wall of the companionway directly opposite the cargo compartment doors. Aft of the cabin is the passengers' baggage compartment, with a capacity of 112 cu. ft., where additional mail may be stowed if desired. An exterior door on the side of the fuselage provides access to this



An interior view of the passengers' cabin of the Douglas D.C.1 "Transport."

compartment from the ground, and it may be reached in flight by stepping through a doorway from the lavatory.

The pilots' roomy compartment has adjustable chairs and a wind shield designed for the elimination of reflection and glare. The movable non-splinterable glass panels which form the wind shield may be cleaned externally while in flight. The landing wheels may readily be seen from the cockpit when they are in the extended position. A complete set of controls is provided for each pilot and the control columns are offset to swing close to the side walls where they present no obstacle to the entering of the seats. A Sperry Gyroscopic Automatic Pilot (air-hydraulic type) can be installed by making a suitable rearrangement.

A complete set of instruments is installed in group arrangement to facilitate rapid scanning, the instrument panel itself is mounted on flexible rubber bushings to minimise vibration. Indirect lighting with rheostat controls is provided. The D.C.1 may be fitted with two-way radio telephone equipment and directional beam receiver. A trailing antennae is extended through the fuselage tail cone.

It was one of these airliners that carried out a remarkable flight across the American Continent on February 19—the last day before the private commercial air mail lines

handed over the transport of air mails to the U.S. Army pilots, under President Roosevelt's order cancelling all air mail contracts. Evidently with a view to showing what private commercial airlines could do, Transcontinental & Western Air, Inc., despatched the first of their new D.C.1's from Los Angeles, piloted by the well-known American pilot, Capt. Eddie Rickenbacker, and carrying 12 passengers, crew and a large quantity of mail—in fact, we understand that the machine carried an excess of full gross load. Making stops at Albuquerque, Kansas City and Columbus, Ohio, the machine covered the 2,653 miles to Newark, New Jersey, in 13 hours 4 minutes 20 seconds—or at an average speed of 205 m.p.h. For a greater part of the journey the Sperry Automatic Pilot relieved the pilot of the bulk of the piloting. After leaving Columbus they ran into a severe storm, and with the aid of the supercharged engines ascended to 20,000 ft. At this altitude the temperature outside the machine was some 75 deg. below zero, but this did not inconvenience the passengers (who, incidentally, were supplied with oxygen), thanks to the efficient heating arrangements of the cabin. When descending to lower altitudes a speed of 280 m.p.h. was maintained for an hour and a-half.

JAPANESE AIR TRAFFIC

We are indebted to our Japanese contemporary *The Koku Jidai (The Aerial Age)*, for the following official figures of air traffic in Japan during 1933:—

Companies	No. of Flights	Distance Flown km.	No. of Passengers	Freight kg.	Mail kg.
1	5,301	1 744 105	10,716	28 516	93 950
2	1,156	167 620	5,092	35 608	3 831
3	100	38 000	—	11	28
4	97	14 190	107	738	35
Total	6,654	1 963 915	15,915	64 873	97 844

1. Nippon Kokuyuso Lit. (Japan Aerial Transport); Tokio-Osaka-Fukuoka-Parien (Main Route). 2. Nippon Kokuyuso Kentyusho; Osaka-Takamatsu-Mutsuyama (Inland Sea Route). 3. Asahi Kokukai; Kokio-Nūgata (Local Route). 4. Tokio Kokusha; Kokio-Shimizu (Local Route).

Compared with 1932 the above figures show the following:—

Flights, an increase of 214. Distance, a decrease of 19 845 km. Passengers, an increase of 3,358. Freight, an increase of 29 922 kg. Mail, an increase of 53 442 kg.

During 1933 the total number of hours flown was 1,942, and accidents resulted in one death, 10 injured, 21 machines and 16 engines destroyed.

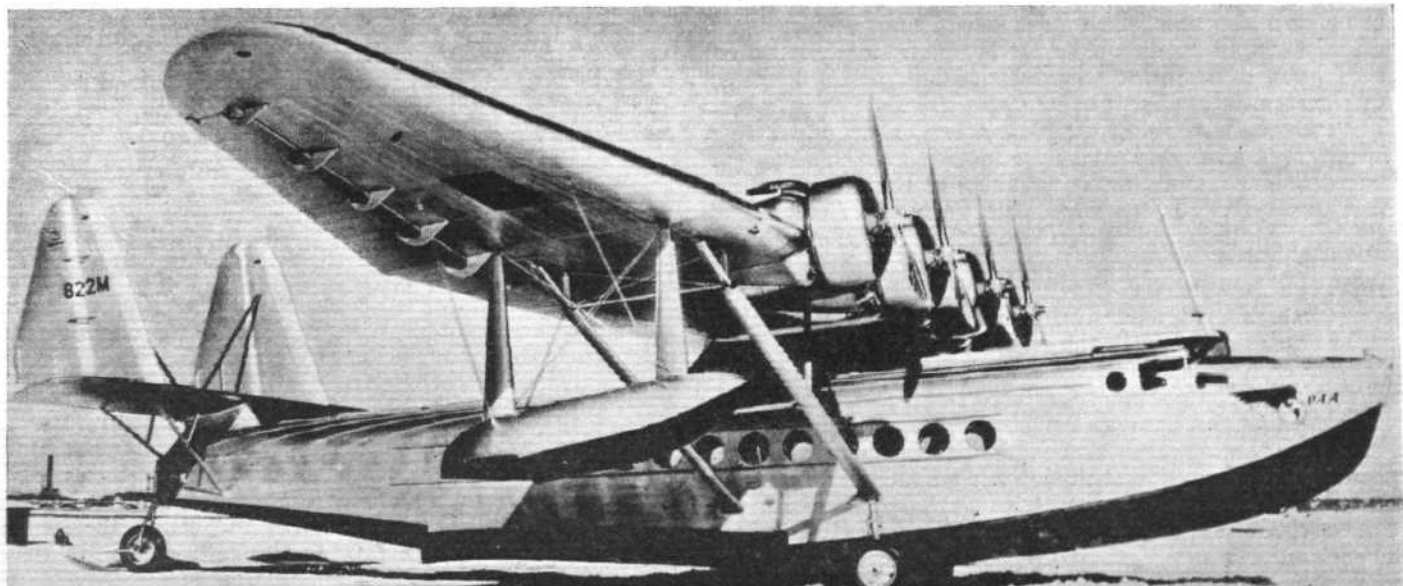
DERULUFT IN 1933

DEUTSCH RUSSISCHE LUFTVERKEHRS GESELLSCHAFT, commonly called "Deruluft," announce the following interesting details of their services during 1933. The winter

service carried out experimentally in 1932, was run to a timetable during the months of January to March in 1933, so that "Deruluft" activities, which had previously only been carried on for half the year, were extended to a nine months' flying season. From May to October the east and north routes, Berlin-Danzig-Konigsberg-Kaunas-Moscow and Berlin-Tilsit-Riga-Tallinn (Reval)-Leningrad, were flown daily, including Sundays. The total distance flown was 1 260,569 km. (783,280 miles); 7,658 passengers were carried (3 540,001 pass./km), an increase of 61.7 per cent. over 1932; 164,514 kg (362,229 lb.) of freight and 31,611 kg. (69,690 lb.) of air mail were carried, increases of 57.4 per cent. and 30.4 per cent. respectively. The total load (passengers, freight and air mail) for 1932 on scheduled lines was 403,208 ton/km, an increase of 33 per cent. Despite the winter service over a 1 700 km (1,056 miles) route, a regularity of 96.2 per cent. was attained for the total scheduled routes. The summer and autumn regularity was naturally somewhat higher, being 99.5 per cent. Berlin/Konigsberg and 98.1 per cent. Konigsberg/Moscow. It is also worth noting that since "Deruluft" started in 1922 no passenger has suffered any injury.

AMERICAN AIRWAYS ORDERS VULTEES

It is reported that American Airways has ordered from the Airplane Development Corporation ten single-engined Vultee V-1's. The first machine of the batch should be flying within a month. The original V-1, it may be remembered, was a nine-seater cantilever monoplane with a single Wright "Cyclone" engine. A top speed of 225 m.p.h. was claimed, the cruising speed being 195 m.p.h. and the landing speed 65 m.p.h.



FOR TRANSATLANTIC SERVICE?: The Sikorsky S.42 four-engined flying boat recently completed for Pan-American Airways. After tests it will be put into service between the United States and South America, and subsequently may be used for transatlantic service.

A RAIL AND AIR COMBINE

THE following announcement concerning the railway companies' plans was issued on February 21 by the Railway Companies' Association:—

"The four main line railway companies and Imperial Airways, Limited, have reached agreement for the formation of a new company with a nominal capital of £50,000 to provide and operate air services in the British Isles and elsewhere and to form connecting links with the services of Imperial Airways. The general lines of the new organisation have also been agreed upon, but no announcement in regard to particular services can be made for some time, as a number of preliminary arrangements are first necessary."

The following reference to air transport was made by Sir Josiah Stamp, Chairman of the L.M.S. Railway Co., at the Annual General Meeting of that company in London on Friday:—

"We have under close consideration the question of exercising our air transport powers, reviewing from time

to time the various developments in this country. Although it cannot be said that any commercial air service in the world yet stands upon a secure profit-making basis, and this country is not specially suited for such services, the matter has assumed some urgency with us, owing to the more recent activities of certain established airway companies and their preparations for the inauguration of regular commercial services between important centres in competition with our rail services. It is desirable for the four main line companies to act in co-operation, especially in view of their overlapping interests, and we are agreed that it would be more to our advantage to act in conjunction with them rather than ourselves to attempt to perform the various technical services required.

"We are accordingly in process of negotiation with Imperial Airways, Ltd., for a separate company, jointly owned with them, to provide such services as any of the railway companies may desire, but matters are not sufficiently advanced for me to give more specific details."

DE HAVILLAND'S EXPRESS AIR LINER

THIS machine, of which we were able to publish the first full description last week, has naturally caused a great deal of interest. In this connection we welcome the following letter from Capt. H. S. Broad, the de Havilland Aircraft Company's well-known pilot.

"On reading through your excellent description of the de Havilland four-engined express air liner this morning, I notice that you have quoted the landing speed as 72 miles per hour, which is considerably in excess of the actual stalling or alighting speed.

"During the trials at Martlesham Heath, the stalling speed in a fully-loaded condition was established at 66 m.p.h. (106.2 km/h). As the performance figures you print will certainly be widely read all over the world, I would be grateful if you would insert a correction in your next issue. In practice, of course, an aircraft is very rarely landed in with full load, as on the conclusion of a flight, weight has been reduced by reason of the fuel consumed in flight.

"Having flown the D.H.86 during all its trials, under all conditions of load and with every combination of engines,

I am very glad to report that I have found it delightfully light and positive on controls, straightforward in landing and, if anything, easier to fly than the "Dragon," which, as you know, is very highly regarded in that respect.

"It may interest you to know that during its trials I took off and flew the D.H.86 on the power of two engines only, with the propellers removed firstly from the two inboard engines and then from the two outboard engines.

"During these flights the aircraft carried 80 gall. (363.7 l) of fuel and was loaded to 6,940 lb. (3,147.9 kg), which included one passenger, 260 lb. (117.9 kg) of ballast, and the weight of two dead engines and their installation gear, amounting to over 1,000 lb. (453.6 kg), equivalent to a pay load of nearly 1,500 lb. (680.4 kg), with a range of over four hours.

"In this condition the top speed, even with the standard propellers, which are naturally very inefficient and under-revving, averaged about 127 m.p.h. (204.4 km/h), and the take-off would have complied with I.C.A.N. requirements. The object of these tests was to determine the relative propeller efficiency of the inboard and the outboard engines."

The Bombay—Calcutta air service

We learn that the proposals put forward by Tata Sons, Ltd., to the Government of India for operating a daily service between Calcutta and Bombay, on condition that all first-class mail matter between the two cities be sent by air, have been refused by the Government on the grounds that the sending of all letter mail on the route by air would involve too great expense for the Government, and also that money is not available for the ground organisation suggested. We understand, however, that alternative proposals will be submitted.

Calcutta—Madras air service

ON February 10 the Madras Air Taxi Service started operating a bi-weekly passenger and mail air service between Calcutta and Madras, stopping at Gannunaru, Vizagapatam and Puri to connect the East- and West-bound services of the Indian Trans-Continental and Indian National Airways.

Mr. Plesman to make inspection trip

ON March 22, Mr. A. Plesman, manager of K.L.M., will leave Amsterdam in the regular K.L.M. machine for a journey of inspection along the Indian route of K.L.M.

Avros for Imperial Airways

We understand that Imperial Airways, Ltd., have placed an order with A. V. Roe, Ltd., for two eight-seater, twin-engined machines having a high performance and suitable for feeder services.

The Compagnie Generale Transsaharienne

FLYING in a Caudron "Phalène," the French pilot, Monteil, of the Cie. Générale Transsaharienne, flew from Paris to Colomb-Bechar in 46 hours. Plans are under consideration for the development of an air service between Reggan, Bidon V and Gao, and it seems probable that

a service will shortly be started between these places to run every fifteen days in both directions.

Sabena statistics

THE following are the figures for the services of SABENA for January, 1934. Figures for the same month last year are given for comparison.

	Miles Covered.	Passenger Miles.	Ton miles of Freight.	Ton miles of Mail.
January, 1934 ..	24,500	30,600	1,950	246
January, 1933 ..	29,100	45,250	3,520	390

Holland—Scandinavia air traffic

THE airline Amsterdam-Copenhagen-Malmö v.v. connecting in Amsterdam with the K.L.M. lines to and from London and Paris is, perhaps, one of the busiest lines of Europe. The K.L.M. is operating the stretch Amsterdam-Malmö in co-operation with the Swedish society A. B. Aérotransport. The latter compiled a record of the nationalities of the passengers who, during 1932 and 1933, made use of the air connection. For both years the number of Swedish travellers is by far the greatest; for 1932 29.68 per cent. of passengers were of this nationality; for 1933 31.19 per cent. Next come British with 24.66 per cent. for 1932 and 19.28 per cent. for 1933, the Danish with respectively 15.94 and 16.13 per cent., the Dutch with 14.05 and 13.13 per cent. For 1932 1.47 per cent. of travellers were citizens of the United States, against 3.37 per cent. for 1933. The other passengers were French, German, Norwegian and Finnish. The total number of passengers transported on the stretch Amsterdam-Malmö was 6,466 during 1933, against 4,279 for the previous year.

From the Clubs

THE HERTS AND ESSEX AEROPLANE CLUB

On Thursday, February 22, the Herts and Essex Aeroplane Club held their third annual dinner and dance under the chairmanship of Mr. A. R. Frogley. The work put in by the Frogley family, not only in establishing the aerodrome at Broxbourne, but in building up one of the most flourishing clubs in the country, will go down to history as one of the better things achieved during the three past rather lean years. Their third annual dinner exemplified the growth of the club, as, from small beginnings it had grown to a comparatively large and fashionable affair which was held in the Wharncliffe Rooms, Hotel Great Central.

Well over 200 people enjoyed themselves thoroughly and witnessed the presentation by Lt. Col. F. C. Shelmerdine, Director of Civil Aviation, of the large number of cups for the club competitions which had been held during the past year. They were also gratified to hear that both Col. Shelmerdine and Mr. J. A. Mollison had offered cups to be competed for as the club committee saw fit.

Speaking on "Civil Aviation," Mr. Mollison referred to the early days when he himself was an instructor at a flying club in Australia, a period which he enjoyed very much. He then went on and expressed the desire that the speed of commercial flying would be increased considerably before long. He drew attention to the large number of internal airlines which were springing up in this country, and hoped that they would learn from America, where a line which ran "every hour on the hour" had proved to be a great success. He said that he had been going into the matter himself extensively, and was satisfied that a line running between London and Glasgow, which could count upon 30 per cent. of the first-class traffic at present carried by rail, would prove to be a success.

Replying to the toast which had been proposed by Mr. Mollison, Col. Shelmerdine reminded those present of the debt of gratitude which they owed, and the irreplaceable loss which they had suffered, by the death of Mrs. Frogley, the mother of their chairman. He continued his speech with some statistics which showed very clearly indeed the great progress made by the club. He said that for the period April 1, 1931, to March 31, 1932, that is the period during which the subsidy was paid on the old £10 basis, the club members secured 28 "A" licences and there were four renewals, the amount of subsidy paid being £240. For the next period, April 1, 1932 to March 31, 1933, when the subsidy was granted on a new basis, 26 "A" licences were secured, two "B" licences and 20 renewals, while the amount of subsidy earned was £893. For the last six months, that is, from April 1, 1933, to September 30, 1933, the figures were 17 "A" licences, 13 renewals and £545 worth of subsidy, so that there was every reason to suppose that the full year would prove to be the best so far. Put in another way, he said that during the first year the club was twelfth out of fifteen subsidised clubs and in the matter of membership thirteenth out of fifteen clubs. In the second year they were fifth out of fifteen for earnings and tenth out of fifteen for membership, while for the first six months of the current year they were seventh out of eighteen for earnings and had increased to fifth out of eighteen for membership. As a more general measure of the growth of civil aviation, he said that there were slightly under 1,000 licences issued during 1933, an increase of 14 per cent. over 1932. This number included 141 "B" licences, which was an increase of 40 per cent. over 1932. In all there were some 2,900 current licences at the present time, of which 128 had been issued to women. Therefore he felt that we were justified in saying that general progress had been very good, despite the bad times. Talking of the growth of internal airlines, he felt that it was entirely wrong to generalise, particularly when comparing our conditions with those in the United States of America. Especially was this so with regard to cruising speeds. It was purely a matter of comparison, and in this country there were many places where a cruising speed of somewhere about 130 m.p.h. was not only more than adequate to compete with existing transport services but was infinitely more economical than high speeds in the region of 200 m.p.h.

For European routes, however, he thought it was essential that the speed be raised considerably. He hoped that it would be possible to give some Government assistance to the operators of these lines, and if that were found possible, he thought that in all probability assistance would take the form of established wireless and meteorological services. He looked upon the recent announcement by the railways as one of the most momentous which had been made, and hoped that it would prove of ultimate benefit to aviation.

Capt. Diamant then proposed "The Health of the Club," and in doing so voiced a plea that the members who had not learned to fly should forthwith do so. The toast was replied to by the chairman, Mr. A. R. Frogley, who thanked the members for the support they had given him and told those present that, although during the past year the clubhouse had been extended by the addition of amenities like a billiard room, and so forth, it had become necessary to extend again and would, he hoped, be necessary to extend still further in the future.

Presentations were made to Mr. S. A. Perrin and Mr. Whittaker for the loyal services they had given to the club. The latter is the club's chief ground engineer, and on him and his staff falls the care of all the club machines. In conclusion, the club's appreciation was expressed of the excellent work which has been done for them by their secretary, Mr. F. E. Darlow. Nothing, it was said, was ever too much trouble for Mr. Darlow, and no one could have carried out the work more efficiently than he had done.

HATFIELD

The flying times for the London Aeroplane Club totalled 35 hr. 15 min. during the last week. Among new members the Club have much pleasure in welcoming Miss P. Bradford. Two more members have been elected to serve on the Club Committee, Messrs. J. V. Holman and F. H. Marusoh. The flying times for the R.A.F. Reserve amounted to 62 hr. 5 min., the R.A.F. Reserve Flying Club 4 hr. 35 min., and the Stage and Screen Aero Club 2 hr. 30 min., Mr. Ralph Richardson completing his "A" licence. Mr. Fulford, one of the instructors at Hatfield, has left for a two months' tour of South Africa with Sir Malcolm Campbell. F/O. V. R. Moon has joined the Instructor's Staff. Private owners who flew during the week-end were Lady Bailey, Sir Derwent Hall-Caine, Capt. Monohan, Messrs. Marusoh, Place and Samuelson. Lady Loch left on February 21 for a tour round the South of France and Sicily in her "Moth." Visitors by air included Mr. Ramsay in a "Martlett," Messrs. Tweddle, Horden, Opie, Bush, and Patten in "Moths," Mr. Marshall in a "Puss Moth," and Mr. Amherst in an "Avro." The Saturday Dinner Dances have now been discontinued, and in their place informal Dinner Dances will be held from 8—12 p.m. (evening dress optional). The Squash Club played their first match against "The White Elephant" Club of Trinity Hall, Cambridge, on Thursday, February 22. The Club, who were represented by Major Newnham, Messrs. Thomas, Moon and King, won, the score being 3—1. Two other matches have been arranged, against Corpus Christi College on Wednesday, February 28, and against Hadley Wood on Friday, March 23.

CINQUE PORTS FLYING CLUB

Fog during the latter part of the week curtailed flying times, which only totalled 16 hr. 50 mins. On Tuesday night flying activities took place in co-operation with Brooklands, two pupils being sent by them from Croydon to Lympne and Mr. Anderson receiving dual and being sent from Lympne to Croydon, thus three "B" licence tests being completed in the one night. On Wednesday nine Hawker "Harts" from No. 18 Squadron and two from No. 24 Squadron arrived at Lympne prior to escorting H.R.H. the Prince of Wales to Brussels. The pilots and observers all lunched at the Club before leaving at 2 o'clock to meet the Prince over Dover. On Tuesday Mr. Van Marken and Mr. Midgley arrived on their way to deliver a "Puss Moth" and a standard "Moth"

("Gipsy I") to Amsterdam. Unfortunately weather conditions prevented them from carrying out their intended flight, and after waiting for three days they were forced to return to London.

HANWORTH (N.F.S.)

Flying time during the week on Club aircraft amounted to 30 hr. Mr. Kirwan successfully carried out his night flying test for a "B" licence and Capt. Wilson gave night flying instruction to Miss D. Reynolds and Mr. Back. Two new members have joined the Club during the week, Messrs. R. Pierce and G. Limbdi. Mr. Rolfe von Bahr has now satisfactorily completed all flying and ground tests for his "B" licence. During the week he will be flying back to Sweden in an Autogiro. He is forming a company which will be the official Swedish agents for Autogiros. The "Moth," which was recently crashed, has been completely rebuilt within two weeks in the workshops.

CARDIFF AEROPLANE CLUB

The flying times for the week amounted to 12 hr. 40 min. dual, 8 hr. 45 min. solo, and 1 hr. 5 min. tests. There is one new flying member, Mrs. W. G. Nicol.

BRISTOL AND WESSEX AEROPLANE CLUB

During the past week Club machines flew for 36 hr., Mr. M. V. Williams completing his "A" licence.

LIVERPOOL AND DISTRICT AERO CLUB

The flying returns for the week ending Friday, February 23, totalled 18 hr. 35 min. dual and 29 hr. 25 min. solo.

YORKSHIRE AEROPLANE CLUB

About 23 hr. flying was put in by Club machines during the week. There was one first soloist, Mr. E. A. Gadie, of Bradford.

BROOKLANDS

A good spell of weather considerably increased aerial activity, 35 hr. dual and 39 hr. solo having been flown, 4 hr. 20 min. of this being night flying. Successful first solos were carried out by Messrs. Murphy and Fotheringham. Cross-country flights were carried out to Oxford, Hatfield, Ipswich, Canterbury, Lympne, Salisbury and Birmingham. During the last fortnight six successful "B" licence night-flying tests were carried out under the supervision of Capt. Findlay. The Sales Department has been very busy lately, Capt. Findlay having demonstrated the "Leopard Moth" to all clubs in the southern area. There have been also many inquiries for the new "Gipsy Major Moth," and those desiring delivery of this machine should place orders as early as possible. New members who joined during the week were Messrs. G. Hall, C. F. Barker and P. Stevens.

NORTHAMPTONSHIRE AERO CLUB

Flying time for the week totalled 16 hr. 30 min., the glorious weather of the last fortnight having brought members to the club in force. Work has started on two new hard tennis courts, and it is hoped they will be ready for play by the first week in April, when it is also hoped the new clubhouse will be finished. Recent visitors have been Mrs. Battye, Messrs. R. R. Bentley, T. Scott, Leinser, Llewellyn, Scholes, Watson and Taylor.

READING AERO CLUB

Messrs. Curry and Hamilton have taken delivery of a standard "Hawk" ("Cirrus III") and left at 2.30 p.m. on Saturday for Dublin; at 6 the same evening they were reported to be in Ireland. Visitors to the club during the past week have been the Duchess of Bedford in her "Moth," F/O. H. R. A. Edwards in his "Martlet," Mr. T. C. Sanders also in a "Martlet," Mr. P. Cubitt in the "Puss Moth" belonging to J. S. Fry & Son, and Com. and Mrs. C. W. Croxford.

THE NORFOLK AND NORWICH AERO CLUB

Instruction was given by Mr. Collier to Mrs. F. Crossley, Messrs. F. W. Rushmer and R. T. W. Ketton-Cremer, and solo flights were accomplished by Messrs. A. Kirkby, H. C. Stringer, S. Hansel, A. J. S. Morris, F. W. Rushmer, R. T. W. Ketton-Cremer and Mrs. Crossley, who also made a cross-country flight to Bedford. Unfortunately Lt. Col. and Mrs. F. C. Shelmerdine will not be able to attend the Annual Dinner and Dance which is being held at the Arlington Rooms on Friday, March 2. Mr. J.

Mollison has promised to attend and Mrs. Mollison if engagements permit.

BRITISH GLIDING ASSOCIATION

The fourth annual general meeting of the members of the British Gliding Association was held on Friday, February 23, in the Library of the Royal Aeronautical Society. The Hon. Secretary, Mr. J. L. R. Waplington, read the notice convening the meeting. The Chairman, Mr. S. Whidborne, expressed regret at the unavoidable absence of the President, Col. The Master of Sempill, and read the President's report, which recorded the deep grief felt by all at the death of Mr. Lowe Wyld last May. The B.G.A. had once more to thank Lord Wakefield for a generous donation, which would be of the greatest assistance in carrying on the work of the B.G.A. It had been the original intention that the Association should be financed by annual contributions from affiliated clubs and individual membership, but it had not been possible for these to render adequate support. There was, however, no question of abandoning the activities of the central body of the Gliding and Soaring movement, though co-operation was necessary to place the Association on a firm financial foundation. The official journal, the *Sailplane and Glider*, had since the year 1931 shown an increasing loss. It had, therefore, been decided to issue the paper monthly; to raise the price to one shilling, the annual subscription being 10s., and the half-yearly 5s. 6d.; and to issue it free to all members of the B.G.A. Mr. Grahame-White had intimated that in consequence of his absence abroad during the coming year, he felt it necessary to resign from the post of Hon. Treasurer. The President was sure all would join in expressing to Mr. Grahame-White their grateful thanks for the valuable services which he had rendered to the Association. To fill his place the Council have nominated Mr. P. A. Wills. The Sutton Bank Competition, held on October 7 and 8, was very successful, not only from the flying point of view, but also from the interest displayed by the public. Congratulations were due to the following pilots who had made excellent flights during the past year: Messrs. Baster, Buxton, Collins, Dewsbury, Laver, Mole, Slingsby and Wills. Mr. Laver, of the Dorset Club, was to be heartily congratulated on his magnificent performance over White Horse Hill, Huish, on October 9, when he set up a new British duration record by remaining air-borne 7 hr. 20 min., thus breaking F. O. Mole's record flight of 6 hr. 55 min. From the developments which were now taking place in the North of England, it would seem that there is a possibility that a National Soaring Centre will be established during the next few months, and a long cherished ideal thus realised. During the year under review 29 "A," 20 "B" and 14 "C" glider pilot's certificates have been issued. Mention must be made of the "Willow Wren," designed and built by Cpl. Manuel. This glider had put up some fine performances at Dunstable, and it was on this machine that F. O. Mole made his record flight. The President also wished to refer to the valuable work of the Council and the various Committees, especially to the services rendered by Capt. C. H. Latimer-Needham, whose help as Chairman of the Technical and Contest Committee had been of great benefit.

JOHANNESBURG AERONAUTICAL ASSOCIATION

Club machines during the week ending January 28 were mobilised for relief work in South-West Africa, which was still cut off from the Union by floods. In one case a train was cut off both behind and before by washaways, and the passengers spent a week in the veld before being rescued by aircraft. Mr. G. B. D. Williams, on his return from South-West Africa, accomplished a remarkable 750-mile flight to Portuguese East Africa and back in the time of 6 hr. 30 min. Mr. F. T. Neale, additional magistrate for Johannesburg, went solo, and flying time for the week totalled 60 hr. 10 min., of which 12 hr. 45 min. were occupied by dual.

All but one of the machines sent out by the Club to assist in the relief of the flood victims in South-West Africa returned, with a flying time between them of 52 hr. 10 min. Other flying time during the week ending February 4 amounted to 37 hr. 15 min. There were two cross-country flights. One was to Gwelo in Rhodesia (530 miles) and the other to Ladysmith, in Natal. The Sunday flips for children, the proceeds of which are in aid of the *Johannesburg Star* Seaside Fund, have proved a very successful feature.

A BRITISH KLEMM

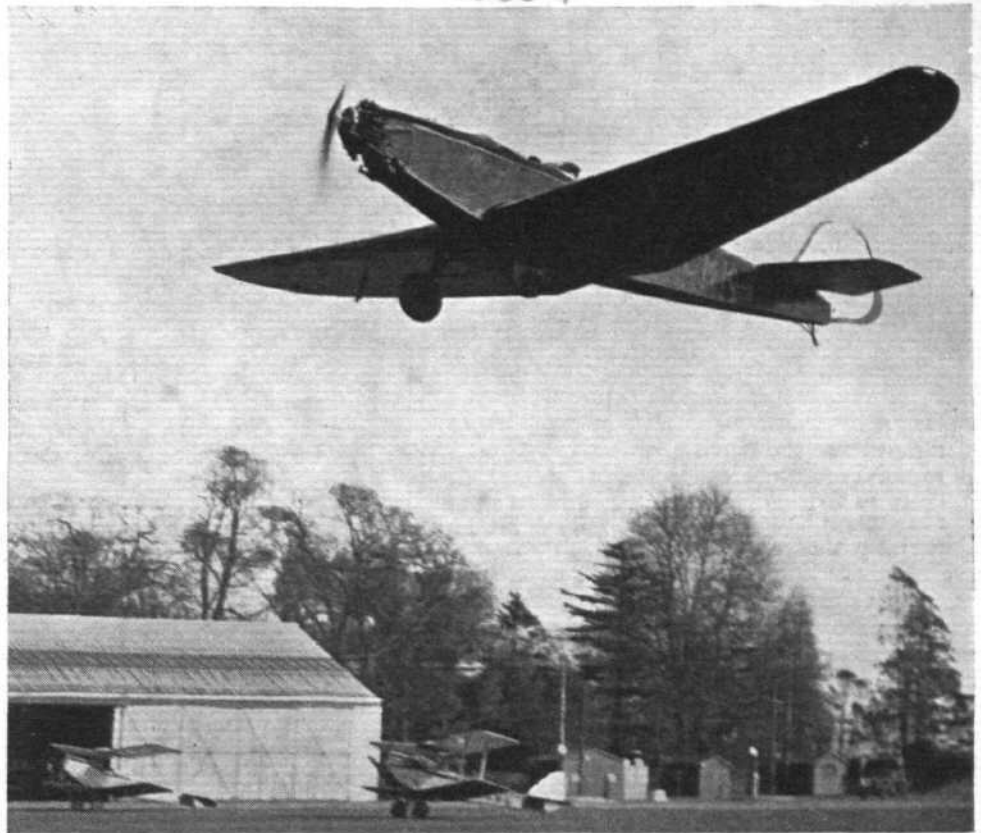
AS early as November 9, 1933, we were able to publish the first details of the two new British Klemm models being built at the works of the British Klemm Aeroplane Co., Ltd., Hanworth Aerodrome, Feltham, Middlesex. Since that date we have on several occasions visited the factory and watched the careful work which has been put into the first production machine. On Wednesday last, February 21, we were able to see the smaller of these two machines, the "Swallow," demonstrated, and to try it out for ourselves.

It is an exceedingly pleasant aeroplane to fly, having in a marked degree that likeable characteristic which gives one the impression that the aeroplane is really making use of the air, and is, as it were, sitting on it, a characteristic which makes for sheer pleasure in flying as a sport, and is very different indeed from the feel of a more heavily loaded machine which has to be pulled through the air at a comparatively high speed to enable it to fly. The Klemm is lightly loaded, being, as it is, something under 7 lb./sq. ft. (34.2 kg./m²). It follows that the gliding and landing speeds are very low, and while it is true that a machine of this nature is peculiarly susceptible to vertical air currents, nevertheless they do not appear to affect it very adversely.

Structurally the "Swallow" is not unlike its German prototype, but it has been generally strengthened up in accordance with British practice. The controls, although they are said not to have been altered very much, seem to be more effective than in the foreign machines, and this may perhaps be due to the better mechanical operation, obviating any possibilities of slackness and slop. The "Swallow" is, according to most British ideas, slightly under-ruddered, and a steep side-slip cannot be held if the speed is low. This, however, seems to us a praiseworthy fault, as the ham-fisted pilot generally gets himself into trouble by injurious use of the rudder. That is not to say that the rudder on the "Swallow" is of insufficient size for all normal use, it is not; even when taxiing at slow speed on the ground there is ample control and for all normal requirements of manoeuvrability, it is perfectly adequate. The controls are nicely harmonised, although the rudder, to our way of thinking,

is inclined to be slightly too light, and in general are of the type which become progressively heavier as the speed increases. This is often criticised as a fault by those who consider things purely from a training point of view, but we feel that a machine which is primarily designed for the amateur pilot and for those who merely want to fly quietly about the country, ought not to have controls so balanced that they give little or no evidence of the speed of the machine. Naturally for supreme manoeuvrability controls of this type are possibly necessary, but for the man who does not want to be incessantly throwing his machine about, we do not feel that they are of any advantage at all. Put briefly, the controls of the "Swallow," while retaining their effectiveness right down to the moment of touching the ground, become sufficiently heavy at top speed to discourage people from using them too coarsely, and we cannot help agreeing with those people who think that this is a most valuable asset to this type of machine.

The wing folding arrangement is both simple and efficient. A lever withdraws both pins at once and a catch, riding up over an inclined plane fixed to the wing centre section snaps down into a slot, holding the wing in the open position until the operator releases it by means of a wire from the wing tip, thus allowing him to



OVER HANWORTH: Mr. E. G. Hordern flying the Salmson-engined British Klemm "Swallow" in front of the club hangar at Hanworth. (FLIGHT Photo.)



A CLEAN FRONT: Large wing area and low wing loading give this Pobjoy-engined British Klemm "Swallow" a spectacularly low landing speed. (FLIGHT Photo.)



NEAR THE GROUND: Its excellent manoeuvrability enables the Klemm to be flown so that pictures may be obtained from the ground like this. On the right is a view showing the newly-designed, sturdy under-carriage. (FLIGHT Photos.)

withdraw the pins; then coming to the wing tip, release the wing, and fold it himself.

The machine we were privileged to fly was the private property of Lord Willoughby de Broke, and was the first production model. It had a 70/75 h.p. British Salmson engine driving a geared airscrew, while the exhaust was carried away beneath the machine through two long pipes. This exhaust system, coupled with the fact that the engine has nine small cylinders running at high speed, make it one of the sweetest little engines we have ever sat behind. Throttled back, by means of the Simmonds-Corsey control to 2,000 r.p.m., with the A.S.I. showing somewhere about 70 m.p.h. (112.6 km/h), it was quite possible to talk from one cockpit to another without the use of headphones. Even at the normal full speed of anything between 2,800 and 3,000 r.p.m. the noise is very much less than that in the majority of aeroplanes, and the lack of vibration was equally noticeable. We were not able to test the machine against a stop watch or obtain corrected figures in any way, but judging from the instruments in the cockpit we have no reason to believe that the figures in the table are other than slightly pessimistic.

Besides this model there is also an exactly similar machine fitted with the Pobjoy engine. We have not yet had an opportunity of trying this ourselves, but we understand that the performance is, as one would expect with an increase of some 10 h.p., slightly better. Moreover the power weight ratio is quite a good deal better, and this in consequence gives the machine a better climb with this engine. Mr. Hordern gave a pretty demonstration of quick take-off, steep climb and slow landing. With the new Pobjoy "Niagara" of 90 h.p., the performance should, of course, be even better.

In both machines the instruments, supplied by Smith's, are conveniently grouped on the dashboard and adequate in number. Despite the top fuselage fairing and the fact that the dashboard is well underneath it, there is ample light, and under no circumstances is there any difficulty in seeing the instruments, a matter which is not always so simple on some machines.

One point which we feel justified in criticising, though small, is important from the point of view of flying comfort, and that is, that tail trimming gear of the rubber cord elevator loading type is used. This gives an entirely false feel to the controls, which is liable to be disconcerting to the inexperienced pilot. No doubt an adjustable tail plane is a somewhat more expensive fitting than



BRITISH KLEMM "SWALLOW"

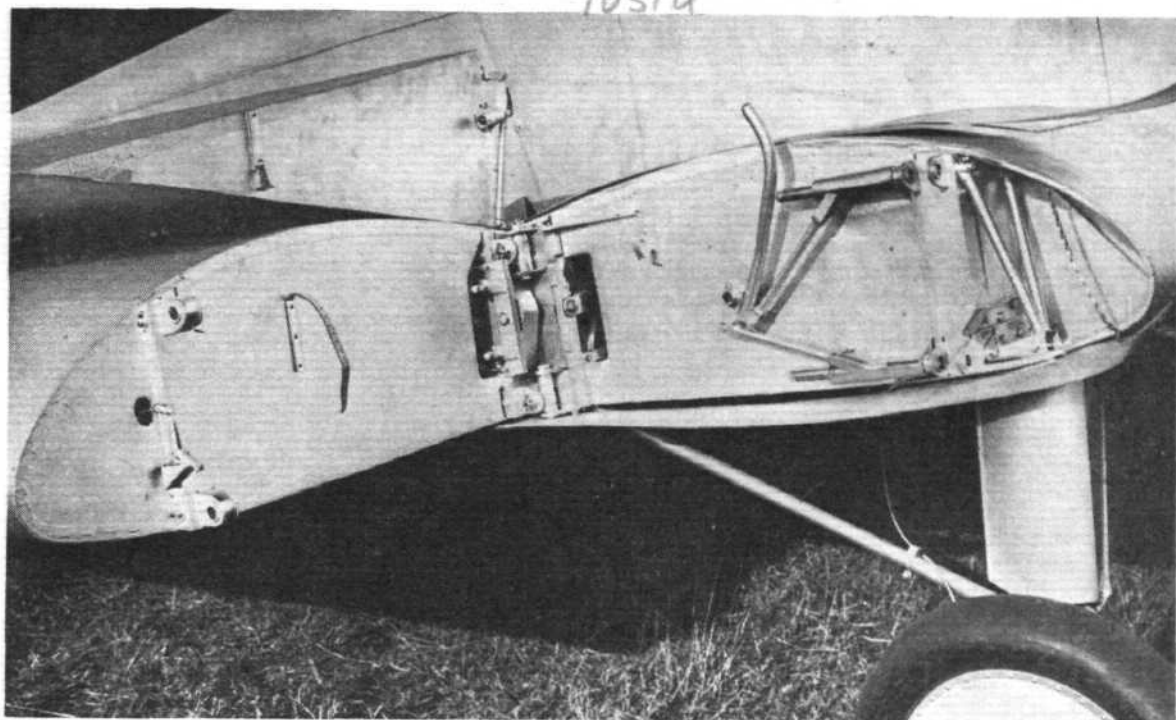
Engine	" British Salmson "	" Pobjoy "
	70/75 h.p.	80/85 h.p.
Petrol consumption ..	4½ gall./hr. (19 l/hr)	4½ gall./hr. (19 l/hr)
Flight duration ..	4.7 hr.	4.7 hr.
Range	400 miles (640 km)	420 miles (670 km)
DIMENSIONS AND AREAS		
Wing area	219.5 sq. ft. (20.4 m²)	219.5 sq. ft. (20.4 m²)
Span overall	42 ft. 8½ in. (13 m)	42 ft. 8½ in. (13 m)
Span, wings folded ..	13 ft. 9 in. (4.2 m)	13 ft. 9 in. (4.2 m)
Chord maximum ..	6 ft. 6½ in. (2.0 m)	6 ft. 6½ in. (2.0 m)
Chord aerodynamic ..	5 ft. 5 in. (1.66 m)	5 ft. 5 in. (1.66 m)
Aspect ratio	8.45	8.45
Length overall	26 ft. 3 in. (8.0 m)	26 ft. 3 in. (8.0 m)
Height	7 ft. (2.14 m)	7 ft. (2.14 m)
Ground angle	13 deg.	13 deg.
Wheel track	6 ft. 3 in. (1.90 m)	6 ft. 3 in. (1.90 m)
Wheels	Dunlop	Dunlop
Tyres	600 × 100	600 × 100
Brakes (extra)	Bendix	Bendix
WEIGHTS		
Weight empty, inc. standard equipment ..	960 lb. (436 kg)	930 lb. (424 kg)
Pilot	160 lb. (73 kg)	160 lb. (73 kg)
Petrol, 19½ gall. (87 l.) ..	147 lb. (67.5 kg)	147 lb. (67.5 kg)
Oil, 1½ gall. (6.5 l.) ..	14 lb. (6.5 kg)	14 lb. (6.5 kg)
Pay load (passenger and luggage, or freight) ..	219 lb. (100 kg)	249 lb. (112 kg)
Weight loaded	1,500 lb. (683 kg)	1,500 lb. (683 kg)
LOADINGS		
Wing loading	6.84 lb./sq. ft. (33.4 kg/m²)	
Power loading (" Salmson ") ..	20.0 lb./b.h.p. (9.1 kg/hp)	
" (" Pobjoy ")	17.65 lb./b.h.p. (8.0 kg/hp)	
PERFORMANCE		
Maximum speed	102 m.p.h. (163 km/h)	110 m.p.h. (176 km/h)
Cruising speed	90 m.p.h. (144 km/h)	98 m.p.h. (157 km/h)
Landing speed	32 m.p.h. (51 km/h)	32 m.p.h. (51 km/h)
Take-off, solo	36 yd. (33 m)	35 yd. (32 m)
Take-off, with passenger ..	53 yd. (48 m)	50 yd. (46 m)
Rate of climb	750 ft./min. (3.83 m/sec)	800 ft./min. (4.07 m/sec)
Gliding angle	1 in 12	1 in 12
Ceiling	16,000 ft. (4 850 m)	17,000 ft. (5 150 m)

STANDARD EQUIPMENT

Dual Control, Petrol Gauges (2), Oil Pressure Gauge, Engine Revolution Indicator, Air Speed Indicator, Altimeter, Cross Level, Upholstered Cushions, Carpets, Luggage Compartment, Map Case, Speaking Tubes, Tool Kit, Kigass Primer, Telephone Tubes.

elevator loading, but it is surely a provision which we are now entitled to expect on machines of the class of the British Klemm.

The demonstration on Wednesday was given by Mr. E. G. Hordern, the firm's test pilot, and most effectively showed off the essential features of a lightly loaded machine, including low gliding and landing speeds, a short run and good take-off. The equipment offered with the machine is sufficiently comprehensive for all normal use, and includes items like a Kigass primer for the engine, telephone tubes, and compass, which are often not standard. Besides Lord Willoughby de Broke, the chairman of the company, Maj. H. Musker, Maj. E. F. Stephen and the other directors were there to welcome their guests, and they did everything possible for them, answering all manner of questions and lending their machines to anyone who wished to fly them. After spending some time on the aerodrome we were taken round the works by that old



FOR EASY HANDLING : A good view which shows the lever for withdrawing the front wing joint pins and also the catch in the leading edge making wing folding a one-man job.

(FLIGHT Photo.)

pioneer, Mr. George Handasyde, who is in charge of the works, with Mr. H. B. Boulton under him as designer. There we saw several more "Swallows" ready for shipment to Mombasa, Australia, and other parts of the world, besides which there was the very interesting air frame of the "Eagle" (described in FLIGHT for November 9, 1933) in a fairly advanced state, and we hope to have more to

say about this machine next month. When we left, Lord and Lady Willoughby de Broke were getting ready to fly back to their place at Kineton, Warwickshire, where they have their own aerodrome, and incidentally Lady Willoughby de Broke has now learned to fly the machine herself; in it she accompanies her husband to Meets, as he is a joint M.F.H.



THOSE RESPONSIBLE : (l. to r.) Mr. J. H. Musker (Director), Lady Willoughby de Broke, Lord Willoughby de Broke (Chairman), Maj. E. F. Stephens (Managing Director), Mr. E. G. Hordern (Test Pilot), Mrs. Musker, Maj. H. Musker (Director), Mr. C. Best (Manager).



The new French air minister

GENERAL DENAIN, Chief of Staff of the French Air Force, has been appointed Minister for Air in place of M. Pierre Cot. During his period of office M. Cot has done much towards reorganising French aviation. General Denain, who was born in 1888, is from the Military School of St. Cyr, near Versailles, which has produced many famous soldiers, including Napoleon.

Gyroscope lectures

WITH reference to the Thomas Gray Lectures for the session 1933-34, the Royal Society of Arts, John Street, Adelphi, have arranged for Professor J. G. Gray, D.Sc., F.R.S.E., M.I.E.E., of the Department of Applied Physics, University of Glasgow, to give three lectures on Gyroscopes.

They will be held on Monday evenings, April 16, 23, and 30.

Many happy returns

ON the fourteenth anniversary of the formation of the Soviet Army, the Ossoaviakhim, the controlling organisation of Soviet aviation, will present the Red Army with 44 bombing aircraft.

Carnets for air touring

MAJ. C. J. W. DARWIN, D.S.O., and Mr. H. E. PERRIN, representing the Royal Aero Club, attended a special Conference of the Fédération Aéronautique Internationale in Paris on February 5 and 6, to deal with the new form of Carnet for air touring and to draw up recommendations to be submitted to the Commission on International Customs.

Airport News

CROYDON



NOTABLE event during last week was the announcement that Capt. L. A. Walters, one of Imperial Airways' senior pilots, had been granted the first Master Air Pilot's Certificate issued in this country. The qualifications include air navigator's licence and commercial pilot's licence, both of which must have been in force for at least five years, with at least 1,000 hours' flying of civil aircraft during the five years. It also means having done at least 20 cross-country flights begun and completed at night. This is not so easy, nor quite so sensible, as it sounds, for commercial pilots, because most flights are scheduled to commence in daylight and finish after dark, or to begin before dawn and finish just before breakfast time. Passengers, at any rate, would not thank a company for embarking them at 11 p.m., for example, and disgorging them in Paris at 1 a.m. It is obvious that the qualification for Master Air Pilot should be a certain number of hours flown in darkness and a certain number of departures and arrivals made by night.

I understand that Mr. Dudley Travers, now in the East with Imperial Airways, Ltd., has also obtained this coveted certificate. Other names should appear shortly in the same connection.

I am asked by Provincial Airways, Ltd., to correct an error of mine last week, when I described the company as a private one. It is, of course, a public company. It also appears that the large number of towns at which they seemed to be scheduled to call on their London-Plymouth-Hayle line are mostly to be called at only on request. This company will go a step further than is usual in pampering the air passenger, who will be picked up at his own front door and set down at the front door of his place of destination. Nothing will remain to be done for passengers shortly, except to call them in the morning with a free cup of tea and place their shoes, newly cleaned, outside the door.

Last week a pedigree fox terrier gave birth to a litter of puppies when on board an Air-France machine on the way to Paris. Mother and offspring are said to be doing well. I recollect no previous affair of this nature, though eggs have been laid aboard commercial aeroplanes.

Mr. Philip Bailey, a well-known "taxi" pilot at Croydon, made an attempt to get through to Brussels one day last week, but eventually had to land at Shoeburyness owing to thick fog. Within ten minutes he had telephoned Croydon Control Tower advising them he was safely on the ground. On the other hand, a privately-owned machine which left Heston at 10.5 and returned to Hanworth at 12.30 p.m. one day during the past week was still "missing" so far as the Croydon Control Tower was concerned until about 6.15 p.m. I do not know where the fault lay; possibly not with the owner at all, but one day there will surely be heavy penalties for this sort of thing, which not only causes needless alarm and expense, but leads to unpleasant newspaper publicity about "missing" aeroplanes.

On Monday, February 19, Herr Alexander von Bismarck left Croydon for Amsterdam on "Moth" G-AAGE. Herr Bismarck, a nephew of the famous Chancellor, learned to fly in 1913, but does not fly professionally. He holds commercial licences for all German aeroplanes, including the G.38 Junkers. He has also passed out on "Moth,"

"Puss Moth," "Leopard Moth," "Dragon" and Comper "Swift." He was a "sailplane" pupil of Herr Kronfeldt, and his whole interest centres round flying. Staying at the Airport Hotel in a room overlooking the aerodrome, he found shaving a lengthy business each morning. His face was more often at the window than at the mirror, he says.

Rollason Aircraft Services, Croydon, announce their appointment as sole agents for Southern England for the "Hermes" engine. The company will shortly move into the premises lately occupied by "Cirrus-Hermes" at Croydon, and several "Cirrus" engineers have joined Rollason Aircraft Services.

Thursday was a curious day at Croydon. Whereas the rest of Europe was shrouded in fog, the Airport of London was clear for flying, and services were delayed because terminals the other side of the Channel were impossible from a flying point of view.

Mr. Whitney Straight, American racing motorist, passed through Croydon last Tuesday en route for Milan. He said he would fly a special Westland-built Henderson-designed machine with "Gipsy 6" engine in the King's Cup race. The top speed of this machine he gave as about 180 m.p.h. Mr. Gordon P. Olley, of Olley Air Services, Ltd., is said to be taking a machine to Australia at the time of the MacRobertson Trophy race. He is not competing, and has several vacant seats for people who want to see something of the race. The idea, in fact, is that of a

travelling grand stand and in these days a grand stand should travel—and travel fast.

So far, this has been the very worst winter for fog and bad flying weather within the memory of the oldest inhabitant of Croydon. One of the most experienced air-line pilots on the routes told me that if the same weather had occurred five or six years ago, all commercial flying would have come to a standstill for most of the winter. It speaks volumes for the progress of commercial aviation that this winter there has been far less in the newspapers about fog interrupting air traffic than about its disorganising effect on shipping.

By the way, the time is surely more than ripe for some clear distinction between air route flying and other forms of flying. The other day I saw newspaper headings about flights abandoned owing to fog. They were private enterprises of one sort and another, and on the day in question little or no trouble was experienced on the air routes. Newspapers do not give the impression that shipping is in difficulties because the weather at Maidenhead is totally unsuited to punting.

A. VIATOR.



MASTER PILOT NO. 1: Capt. L. A. Walters, of Imperial Airways, Ltd., who has just been granted the first of the new Master Pilots' Certificates. (FLIGHT Photo.)

HESTON

ON Sunday, February 18, two "Dragons" were run on the daily air service to Jersey. The number of bookings have been so encouraging that a successful summer for this undertaking may confidently be predicted.

The Heston Traffic Hall is rapidly approaching completion and will satisfy a need which is already felt in rush

periods, and which will, it is considered, become acute in the summer of this year, when more airlines are expected to want accommodation for their passengers.

During the past week the private charter services at Heston have been working to their capacity carrying Pressmen to report and photograph the events following the death of H.M. the King of the Belgians. Birkett Air Service made seven return journeys to Brussels, three of which necessitated night landings by floodlight at Heston. The British Air Navigation company made five trips, also returning to Heston in the dark on three occasions. Wireless is fitted to several charter machines at Heston, both

large and small, and in one or two cases the airport was in communication with the pilot until he passed over South-West London, and switched on the floodlight ready for his arrival as soon as the signals ceased. In other cases the floodlight is only put into operation when the noise of the engine is heard, unless, as sometimes happens, it is left on for considerable periods to assist an incoming machine to locate Heston in the fog.

Some 600 sq. ft. have been added to the available space in the big Service hangar by the exodus of "stores." They have been shifted to a newly-erected and roomy out-building at the back of their old quarters.

Replanning the Liverpool airport

It has been provisionally decided that a big re-arrangement be made at Speke aerodrome. This decision was made in view of the prospect of obtaining the sanction of the Air Ministry to the proposal of K.L.M. to make Speke the terminus for a service from Amsterdam via Hull. According to the new plans, it will be necessary for increased accommodation to be provided at the airport, and the Finance Committee of the Liverpool Corporation is recommending the City Council to sanction the expenditure of £12,000 for the erection of a new hangar and workshop. This building, which will be 150 sq. yd. in area, will accommodate three large K.L.M. machines. The complete scheme will include six large hangars with workshops, control offices, waiting rooms and a café. In addition to these buildings, a club hangar and club-house are now in the course of erection. The new buildings will be placed

in the corner of the aerodrome near Speke Road. A fresh entrance from Speke Road and an 80-ft. roadway into the aerodrome are included in the plans. The new arrangements will bring the control offices a mile nearer to the centre of Liverpool. It now seems fairly certain that K.L.M. services with connections at Liverpool with Scotland and Ireland will be in operation by June.

Bristol airport

WESTERN AIRWAYS, LTD., had a busy week-end, which included two fully-loaded trips to Weston-super-Mare with a "Dragon," in connection with a Rotarian lunch on Friday. On Saturday the same firm carried a party of 40 officials and supporters of the Bristol Rovers Football Club to Cardiff for the Bristol Club's match with Cardiff City. The week-end was completed with an air-taxi trip with two passengers from Bristol to Cardiff on Sunday.



Airisms from the Four Winds

R.A.F. South African flight

THE R.A.F. Middle East Command Flight, which is flying to South Africa, left Heliopolis Aerodrome on Monday, February 26. The flight, which consists of four Vickers "Victorias" fitted with Bristol "Pegasus" engines, and five Fairey III F's, Napier "Lion" engines, is commanded by Wing. Com. R. T. Leather, with Sqd. Ldr. P. H. Mackworth, D.F.C., in command of the "Victorias" and Sqd. Ldr. H. W. L. Saunders, M.C., D.F.C., in command of the III F's. The whole personnel of the flight numbers 38. The flight will pass over much ground that is new to R.A.F. flights. After a straight flight to Pretoria, where one day will be spent, the flight will proceed homeward by way of Livingstone, Lusaka, Salisbury, Zomba, Abercorn, Tabora and Dar-es-Salaam. The flight will then probably visit Zanzibar, Mombasa and Nairobi.

Vicomte de Sibour home

VICOMTE DE SIBOUR has returned to Paris after a 17,500 mile tour of the Far East. With his wife, he flew from Paris to Tokio by way of Tunis, Egypt, Asia Minor, India and China.

Mrs. Mollison's return

MRS. MOLLISON arrived at Southampton from the United States on Friday, February 23.

Portuguese air crash

Two military Portuguese aeroplanes collided near Cintra on Thursday, February 22, resulting in the deaths of Lt. Col. Brito Pais, Capt. Rodrigues Alves and Capt. Avelino Andrade.

Marooned party in Arctic

PROF. SCHMIDT and a party of 102 men, women and children, who have been stranded on the ice-floes of the Behring Straits since the loss of the Soviet ship *Chelusken*, have sent hopeful news back to civilisation. Prof. Schmidt states that they have succeeded in dragging the small machine, which was on the ship, a distance of three miles across the ice to a small flat space from which it may be able to take off. This means that M. Babushkin, who distinguished himself in the rescue of the crew of the Italian airship *Italia*, may soon be able to establish communications with the rescue parties on the coast.



NATIONAL RECOGNITION: An air display, organised by the Aero Club of Spain, was given in Madrid recently in honour of Juan de la Cierva, and to celebrate the award to the latter of the F.A.I. 1933 Gold Medal. Here we see Senor de la Cierva giving a display, at the Barajas Military Aerodrome, in the C.30 type Autogiro.



FILMING THE ENGLAND-AUSTRALIA AIR ROUTE : Mr. Roy Tuckett (left) and Mr. John Chapman (photographer), who are flying out to Koepang for the purpose of filming sections of the England-Australia air route. Their "Puss Moth" has been specially equipped with aerial film cameras, and the Vacuum Oil Co. have made all arrangements en route for fuel and oil supplies..

Air rescue for castaways

A LARGE Soviet machine left Moscow on Monday, February 26, to render aid to 545 fishermen and 390 horses, who have been swept away on ice-floes into the Caspian Sea and are in grave danger. Two small amphibian machines were sent out from Astrakhan Port the day before and they managed to drop parcels of food on to the floes.

England-Australia race

A D.H. "Comet" has been entered for the MacRobertson race to Australia by Mr. A. O. Edwards, the Managing Director of Grosvenor House, Park Lane. The "Comet" has a minimum speed of 200 m.p.h. guaranteed by the makers. The pilots will be Mr. C. W. A. Scott and Mr. Campbell Black. A report from New York states that Mr. Clive Pangborn is also to compete in the race.

Portuguese flight to India

ONE does not hear much about Portuguese civil aviation, the reason being that it is, for all intents and purposes, non-existent. However, at the moment these lines are being written a Portuguese civil pilot, Senhor Carlos Eduardo Bleck (who is the very able representative of de Havilland's in Portugal), is waiting for favourable weather conditions to start off on a flight to Portuguese India and back, a distance of 20 558 kilometres. The aeroplane to be used is a D.H. "Moth," powered, one understands, with a "Gipsy Major" engine. The start will be made from the aerodrome of the Military Aeronautical school at Cintra (near Lisbon) and the journey will be divided into the following stages:—Lisbon (Cintra)-Melilla (760 km.); Melilla-Oran (260 km.); Oran-Algiers (370 km.); Algiers-Tunis (640 km.); Tunis-Tripoli

(630 km.); Tripoli-Sirte (405 km.); Sirte-Benghazi (540 km.); Benghazi-Tobruk (438 km.); Tobruk-Alexandria (620 km.); Alexandria-Gaza (465 km.); Gaza-Rutbah (642 km.); Rutbah-Baghdad (414 km.); Baghdad-Basra (530 km.); Basra-Bushire (400 km.); Bushire-Lingh (540 km.); Lingh-Jask (410 km.); Jask-Karachi (890 km.); Karachi-Diu (Gujarat Coast) (670 km.); Diu-Bombay (435 km.); Bombay-Pangim (420 km.).

Senhor Bleck is not out to break any records or to perform any sensational "stunt." Wisely, he has divided the journey up into short stages, the longest being the Jask-Karachi stage, and, given fair weather, he should have no difficulty in turning the flight into a real pleasure trip. With an engine of proved merit and an aeroplane about which no doubts exist, only an unforeseen accident should prevent the successful conclusion of the flight. It will be remembered that Senhor Bleck made an attempt to fly to India in 1928, but had to abandon it on account of a forced landing in the desert near Gaza.

The latest Kinner engine

A NEW air-cooled radial engine, to be known as the C.7, has been produced by the Kinner Airplane & Motor Corp., of Glendale, California. Owing to the efficient disposition of the cooling fins on the cylinders and cylinder heads, it has been possible to lower by about 20 deg. Fahr., the temperature of the cylinders, in comparison with older Kinner models. The mixture is compressed by a centrifugal supercharger, the impeller of which is mounted directly on the crankshaft. This, however, may be replaced by a high-speed supercharger, when the output at altitude is considerably increased. The engine is at present being tested, and the following are the main details which may be published. There are seven cylinders, the maximum length is 44.1 in., maximum diameter 51.5 in., compression ratio 5.25:1, rated power 300 h.p. at 1,800 r.p.m., weight dry, without carburettor air heater, exhaust ring, starter or hub, not to exceed 575 lb.

A French submarine seaplane

BUILT by the Mureaux Company to the designs of M. Marcel Besson, the Besson 41 seaplane is intended for operation from submarines. The machine is a low-wing strut-braced monoplane with central float and wing floats. When fitted with a Salmson engine of 135 h.p., the top speed is 125 m.p.h.

Couzinet high altitude machine

RENE COUZINET, now associated with the Breguet group, is constructing an aircraft designed for operation at high altitudes, two distinctive features being the design of the cabin and the very highly supercharged engine. M. Couzinet hopes to fly this machine over the Atlantic during July or August.

More registrations

JERSEY AIRWAYS, about whose service to the Channel Islands we have already written, now have six "Dragons" registered in their name. The Percival Aircraft Co. have registered a Percival "New Gull" (G-ACND), a machine the details of which we are not yet able to publish, but about whose high speed there are many rumours. The Comper Aircraft Co. have been given the letters G-ACNC for their new "Comper Streak." Details of this machine were given in FLIGHT for May 11, 1933. The first Klemm "Swallow," which was described in FLIGHT for November 9, 1933, has been registered in the name of Lord Willoughby de Broke (G-ACMZ). The Avro "Avian," G-AAAT, so well known at all air displays when in the hands of Mr. W. B. Cubitt during the last three or four years, has now been transferred to Mr. H. G. B. Linnell. A new owner of a "Monospar" (G-ACFR) is Mr. P. A. Wills.

FROM ROUMANIA : This interesting machine, or "avionette," has been designed and constructed by D. Mihail, of Bucharest. Named the "Stabiloplan IV," it is fitted with an A.B.C. "Scorpion Mark II" engine, and a successful private test has already been accomplished. Official tests are to be made later.



NEW AIRCRAFT

The B/J P-16

THE P-16, which is the standard two-seater fighter of the U.S. Army Air Corps, is of all-metal construction, the chief materials used being chrome molybdenum steel and duralumin. Practically any liquid or air-cooled engine from 500-800 h.p. may be used, the machines supplied to the U.S. Army Air Force being fitted with the Prestone cooled Curtiss "Conqueror," type SV-1570, which gives 600 h.p. at 2,400 r.p.m. In a modified version of the P-16 the Wright "Cyclone" (700 h.p.) or the Pratt & Whitney "Hornet" (600 h.p.) may be used. The aircraft has been designed for the latest U.S. "Pursuit" load factors, including diving requirements.

The wings are of all-metal construction, the spars being built up with flanges of extruded sections with "wandering webs," both the flanges and webs being of duralumin. The drag system is composed of duralumin tubular compression ribs with diagonal bracing of swaged steel wires. Ailerons, which are of the Frise "skew" type, are fitted to the upper planes only. The fuselage is a rectangular structure of the welded chrome molybdenum steel truss type, covered with fabric. Chrome molybdenum steel is also used for the engine mounting, which is detachable at four points on the fuselage.

The cockpits may be of either the open type or may be fitted with a cabin top to protect the pilot and gunner from the air stream. This cabin top adds approximately 5 m.p.h. to the top speed and 50 lb. to the weight. The undercarriage of the original P-16 was of the conventional "split" type, but in the latest machine this has been replaced by a cleaner and simpler structure.

The main fuel tank holds 85 gall., and is carried in the fuselage, but an auxiliary "droppable" tank of 75 gall. capacity may be carried below the fuselage, bringing the fuel supply up to 160 gall. Provision is made for the installation of two fixed Browning guns in the fuselage and a movable gun over the rear cockpit. The front guns may be either both of 0.30 calibre or one 0.30 calibre and one 0.50 calibre. For the 0.30 gun 1,000 rounds are provided, but for the larger calibre weapon only 150 rounds are carried. The rear gun is provided with 800 rounds. Although a two-seater fighter, the aircraft can carry up to 500 lb. of bombs.

When fitted to the Wright "Cyclone" of 700 h.p., it is



expected that a speed of 212 m.p.h. at 15,000 ft. will be attained. Both the service ceiling and absolute ceiling, however, will probably be less.

THE B/J P-16 (MODIFIED) (P-127)

Length	28 ft. 10 in.
Height	9 ft. 9 in.
Span (upper)	34 ft.
Span (lower)	23 ft. 4 in.
Chord (upper)	72 in.
Chord (lower)	48 in.
Gap	58 ft. 9 in.
Wing area (including ailerons)	250 sq. ft.
Weight empty	3,109 lb.
Disposable load	1,192 lb.
Gross weight	4,209 lb.

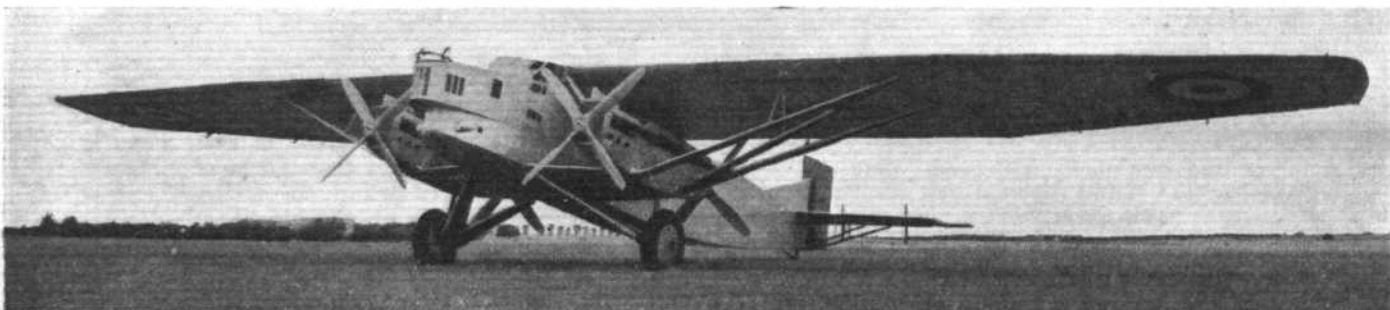
PERFORMANCE (ESTIMATED):

Speed at sea level	170 m.p.h.
Speed at 5,000 ft.	183 m.p.h.
Speed at 12,000 ft.	200 m.p.h.
Speed at 15,000 ft.	192 m.p.h.
Speed at 20,000 ft.	178 m.p.h.
Cruising speed at 12,000 ft.	162 m.p.h.
Climb to 5,000 ft.	2.9 min.
Climb to 12,000 ft.	6.9 min.
Climb to 15,000 ft.	8.8 min.
Endurance at full throttle (normal)	1.6 hr.
Endurance at full throttle (overload)	3.02 hr.
Range at full throttle (normal)	323 miles.
Range at full throttle (overload)	605 miles.
Range at cruising speed (normal)	421 miles.
Range at cruising speed (overload)	785 miles.
Service ceiling	29,000 ft.
Absolute ceiling	30,000 ft.

The Farman 220 and 221

FOR some months past the Farman Company has been testing two large four-engined bombers, known as the types 220 and 221. The type 220 is fitted with four Hispano Suiza 12 Ybns. geared and supercharged water-cooled engines and the 221 has four Gnome Rhone 14 Kbrs.

geared and supercharged air-cooled radials. Although the machines are usually referred to as monoplanes, actually it would be correct to call them sesquiplanes, for, as may be seen from the photograph, there are lifting surfaces between the fuselage and the engine nacelles. Both types are at present equipped as long-range night bombers, but during the test flights of the 220 at Villacoublay, Messrs.



THE FARMAN 220 BOMBER: Three-quarter front view.

FARMAN F. 220

Span...	118.1 ft.
Length ..	70.54 ft.
Height ..	17.05 ft.
Wing area ..	2,002.18 sq. ft.
Weight empty ..	19,208 lb.
Normal gross weight ..	30,864 lb.
Total gross weight ..	35,274 lb.
Normal range with 4,850 lb. of bombs ..	about 745 miles.
Top speed at 13,120 ft. ..	186 m.p.h.
Theoretical ceiling ..	32,800 ft.
Climb to 13,120 ft. ..	8 mins.

N.B.—The performance figures apply to the 220 with Hispano-Suiza 12Ybrs engines.

Noguès and Balizuc, who are technical directors of Air-France, flew in the machine, which might indicate that Air-France is interested in a civil version of the aircraft.

The following description will apply to both the 220

The S.P.C.A. 30 M.4

THIS "multiplace de combat," manufactured by the Société Provençale de Constructions Aéronautiques, possesses a number of interesting features, the most striking of which are probably its twin fuselages. The low cantilever



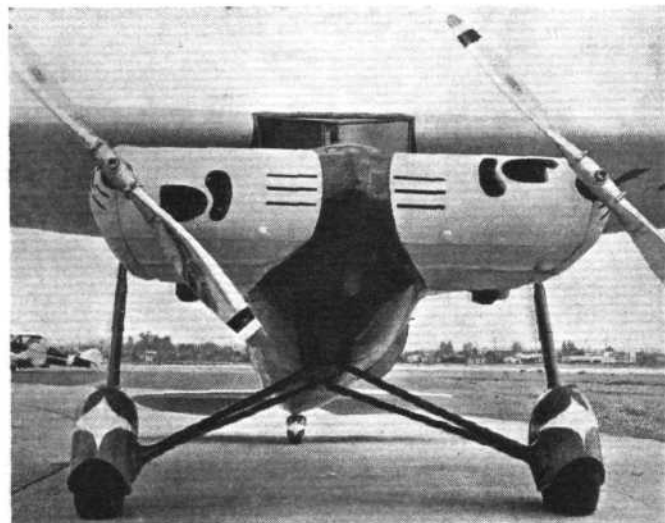
THE S.P.C.A. 30 M.4

Span ..	86 ft. 11 in.
Length ..	56 ft. 5 in.
Height ..	13 ft. 5 in.
Wing area ..	1,076 sq. ft.
Weight loaded ..	14,300 lb.
Wing loading ..	13.3 lb./sq. ft.
Power loading ..	11 lb./h.p.
Maximum speed ..	153.3 m.p.h.
Landing speed ..	56 m.p.h.
Climb to 6,560 ft. ..	6 min.
Climb to 16,400 ft. ..	20 min. 30 sec.
Ceiling ..	24,600 ft.

wing is in three sections, the centre section connecting the two fuselages. In the middle of the centre section is a nacelle which houses the pilots and a navigator-gunner, who is also the bomb aimer when the aircraft is equipped for bombing.

and 221. The inner sections of the main planes are of parallel chord, but the sections outboard of the junction of the bracing struts and the wing are tapered in plan form. Four fuel tanks are carried within the wing. The fuselage is of rectangular section, the maximum height being about 8 ft. and the maximum width nearly 6 ft. In the forward portion of the fuselage is a gunner's cockpit with mounting for twin Lewis guns, bomber's position, navigator's and mechanics' quarters, and an enclosed cabin with dual control for two pilots. The aft portion of the fuselage contains the wireless operator's position and a gunner's position on top of the fuselage. Bomb racks over 16 ft. in length for a normal load of 4,850 lb. of bombs are mounted within the fuselage. Actually a bomb load of 8,818 lb. can be carried if necessary. An undercarriage of wide track, using differentially controlled Messier brakes, is used. The tail wheel is of the swivelling type.

The pilots' cockpits are in tandem and are fitted with dual controls. Aft of these cockpits is a position for a downward firing gun. This position may also accommodate the photographic equipment and bomb racks. The two engines are carried in the noses of the twin fuselages, in each of which a gun ring is fitted aft of the trailing edge of the wing. Two "droppable" fuel tanks are carried, one on each side of the central nacelle. Either Lorraine 18 Kd. 650-h.p. engines or Hispano-Suiza 12 N brs. engines of the same power may be fitted.



UNORTHODOX: The Lockheed "Alcor," similar in general design to the "Vega," has two "Menasco" engines mounted crankcase to crankcase across the nose of the fuselage. The resistance is claimed to be about half that of the normal radial engine installation.



MILITARY LOAD: The Breguet 27 is not of new design, but during the past two or three years it has been continually improved. Here we see it in its latest form—fitted with a Gnôme-Rhône "Mistral Major" 14 KRSd supercharged two-bank radial, which gives well over 1,000 h.p. for take off, and is rated at 815 h.p. at 2,390 r.p.m. at 7,150 ft. As a reconnaissance machine or as a bomber, the "27" is equally efficient. In the latter form, a bomb load of about 1,840 lb. may be carried. The performance figures for the Gnôme-Rhône-engined version are not available for publication, but when the "27" is fitted with the Hispano-Suiza 12 Ybrs water-cooled engine of 850 h.p., it has a maximum speed of about 186 m.p.h., climbs to 16,375 ft. in about 9 minutes and has a ceiling of over 30,000 ft.—not, of course, carrying the maximum permissible bomb load. The Breguet 27 A2, fitted with a 500-h.p. Hispano-Suiza engine, is a standard type in the French Armée de l'Air.

CLOUD FLYING

Precautions to be observed to minimise risk of Collision

THE rapid increase of so-called "blind" flying has necessitated the issue of an Air Ministry notice (No. 92 of 1933, Series A) defining the areas in which practice blind flying may be carried out, in order that safety may be maintained. The following rules are taken from this notice and pilots of civil aircraft, in particular, are advised to follow them.

(A) THE LONDON-CONTINENT AIRWAY AREA

This area, which is shown on the map published herewith, is bounded as follows:—

North Side.—Kingston-on-Thames, along N. bank of River Thames as far as Southend, thence by straight line to North Foreland.

East and South Sides.—North Foreland, along coastline to Bexhill.

West Side.—Straight lines joining Bexhill, Gatwick, Dorking and Kingston-on-Thames.

No cloud-flying by service aircraft except battle flight climbs by units stationed at Kenley and Biggin Hill will take place in this area. Such battle flight climbs will only be performed after consultation with the Chief Aerodrome Officer, Croydon Airport.

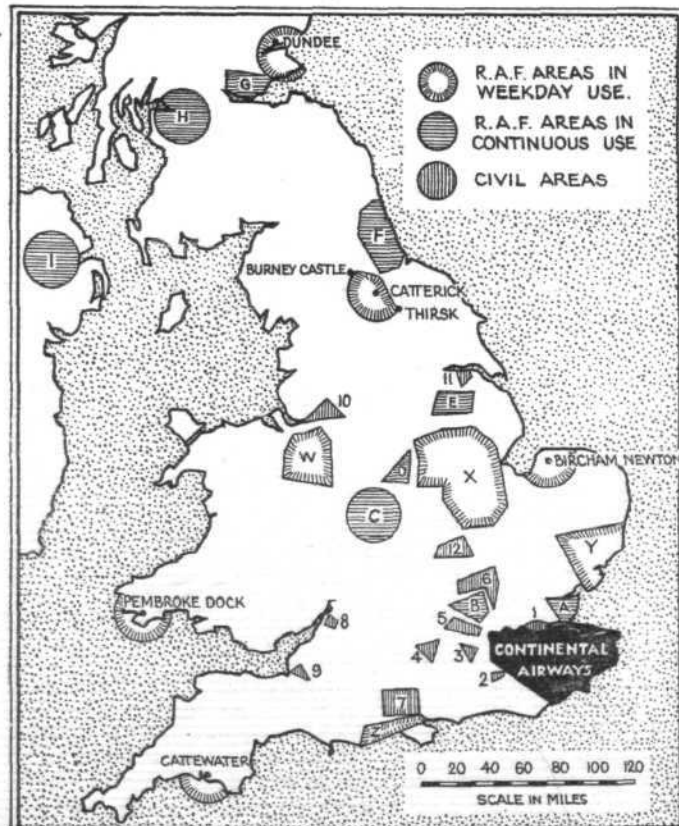
(1) Practice Cloud Flying.—No cloud-flying for practice or instruction should take place within the above area.

(2) Cross-Country Flights.—(a) *Aircraft not fitted with radio.*—Aircraft not fitted with radio flying within the above area should not fly through cloud except in emergency.

(b) *Aircraft fitted with radio.*—Aircraft fitted with radio flying within the above area, other than those operating on scheduled services between London and the Continent, should notify the Control Officer at Croydon before entering cloud, reporting their position, the track and ground speed it is intended to maintain, and the height above sea level at which they are flying and which it is intended to maintain through cloud. The Control Officer at Croydon will then advise the aircraft as to the safety of the course proposed having regard to existing traffic conditions, and the aircraft should wait to receive such advice before entering the clouds.

(B) ELSEWHERE

Aircraft flying in the United Kingdom elsewhere than within the London-Continent Airway Area defined above are asked to observe the following rules:—



(1) Practice Cloud Flying.—(a) Cloud-flying for practice or instruction should not in any circumstances be carried out below a height of 2,000 ft. above ground level.

(b) Civil flying schools and clubs are allotted areas within which their aircraft should normally carry out cloud-flying practice under the control of the instructor responsible for flying training; these areas, hereinafter referred to as "Civil Areas," are detailed in Appendix I, and are shown on the map published herewith. Other aircraft should not carry out practice or instructional cloud-flying within these areas without obtaining the prior consent of the person in charge of the area concerned.

(c) On *Mondays, Fridays and Wednesday mornings*, civil aircraft are advised to confine all cloud-flying practice within Civil Areas only, as during these times Royal Air Force aircraft may be flying, without notice, in cloud above a height of 2,000 ft. above ground level anywhere in Great Britain (excluding only the Civil Areas and the London-Continent Airway Area).

(d) On *Tuesdays, Wednesday afternoons, Thursdays and Saturday mornings* civil aircraft, unless carrying out cloud-flying practice within a Civil Area, are advised to avoid practice flying in cloud within any of the Royal Air Force areas shown on the map published herewith.

(e) During week-ends, i.e., from *Saturday noon to Monday noon*, civil aircraft, unless carrying out cloud-flying practice within a Civil Area, are advised to avoid the Royal Air Force areas shown on the map published herewith as being in continuous use. These areas are also detailed in Appendix II.

Notes.—(i) Civil clubs or schools who may, in future, wish to have cloud-flying areas allotted to them, or who may wish to extend or modify the areas already allotted to them, should make application to the Secretary, Air Ministry (C.A. 4), Adastral House, Kingsway, W.C.2.

(ii) On application being made to the Secretary, Air Ministry (C.A. 4), Adastral House, Kingsway, W.C.2, civil clubs or schools will be furnished with a copy of the instructions issued to Royal Air Force units with regard to their cloud-flying areas; such information may enable further mutually satisfactory arrangements to be made between the civil operator and the Royal Air Force Authority controlling an adjacent area.

(2) Cross-Country Flights.—(a) Aircraft engaged on cross-country flights outside the London-Continent Airway Area should, except in emergency, avoid flying in cloud at a greater height above ground level than 2,000 ft.

(b) Operators of civil aircraft who maintain, or intend to maintain, a regular service, and whom the above rule may inconvenience, should make application to the Secretary, Air Ministry (C.A. 4), Adastral House, Kingsway, W.C.2, in order that special arrangements may be made.

APPENDIX 1

CIVIL CLOUD-FLYING AREAS

Area No. 1.—*Gravesend (Gravesend Aviation, Ltd.).* An area N. of the River Thames and within 8 miles of the aerodrome.

Area No. 2.—*Gatwick (Surrey Aero Club).* Area bounded by straight lines joining Crawley, Horsham, Ockley and Gatwick.

Area No. 3.—*Brooklands (Brooklands School of Flying).* Area bounded by straight lines joining Brooklands, East-hampstead and Guildford.

Area No. 4.—*Reading (Reading Aero Club).* Area bounded by straight lines joining Reading, Newbury and Basingstoke.

Area No. 5.—*Hanworth and Heston (National Flying Services, Ltd., and Airwork, Ltd.).* Area bounded by straight lines joining High Wycombe, Southall, Weybridge and Henley-on-Thames.

Area No. 6.—*Stag Lane and Hatfield (de Havilland Aircraft Co., Ltd.).* Area bounded by straight lines joining Ashwell, Benington, Chipping Barnet, Kingston, Tring and Leighton Buzzard.

Area No. 7.—*Hamble (Air Service Training, Ltd.).* Area bounded by straight lines joining Salisbury, Winchester, Hamble and Ringwood.

Area No. 8.—*Filton (501 Squadron, R.A.F., and Bristol Aeroplane Club).* Area bounded by straight lines joining Wotton-under-Edge, Wickwar, Thornbury and Berkeley.

Area No. 9.—*Whitchurch (Bristol and Wessex Aeroplane Club)*. Area bounded by straight lines joining Highbridge, Axbridge and Glastonbury.

Area No. 10.—*Blackpool (Lancashire Aero Club)*. Area bounded by straight lines joining Frodsham, Barton and Woodford.

Area No. 11.—*Brough (North Sea Aerial and General Transport, Ltd.)*. Area bounded by straight lines joining Read Island, New Holland, Ulceby and Brigg.

Area No. 12.—*Sywell (Northamptonshire Aero Club)*. Area bounded by straight lines joining Higham Ferrars, Bedford, Towcester and Northampton.

Area No. 13.—*Ipswich (Eastern Counties Aeroplane Club)*. As by arrangement with the Officer Commanding, Royal Air Force, Martlesham Heath.

APPENDIX 2

R.A.F. CLOUD-FLYING AREAS IN CONTINUOUS USE (i.e., INCLUDING WEEK-ENDS)

Area A.—*500 Squadron, Manston*. An area bounded by Southend, Chelmsford, Malden and the coast.

Area B.—*Station Headquarters, Hendon*. An area bounded by straight lines joining Harpenden, Elstree, Northolt and Princes Risborough.

Area C.—*605 Squadron, Castle Bromwich*. An area within a radius of 15 miles from Castle Bromwich.

Area D.—*504 Squadron, Hucknall*. An area bounded by straight lines joining Hucknall, Shepshed and Burton-on-Trent.

Area E.—*503 Squadron, Waddington*. An area bounded by straight lines joining Caistor, Wickenby, East Retford and Epworth.

Area F.—*607 Squadron and 608 Squadron, Usworth and*

Thornaby. An area bounded by lines joining Blyth, Ponteland, Consett, Bishop Auckland, Darlington, Thornaby-on-Tees and Hartlepool.

Area G.—*603 Squadron, Turnhouse*. An area bounded by Blackford, Clackmannon, the coastline to E. Wemyss, Markinch and Blackford.

Area H.—*602 Squadron, Renfrew*. An area within a radius of 15 miles from Renfrew.

Area I.—*502 Squadron, Aldergrove*. An area within a radius of 15 miles from Aldergrove.

See also Area No. 8, Appendix 1.

APPENDIX 3

R.A.F. CLOUD-FLYING AREAS IN WEEKDAY USE

Area W.—*No. 5 F.T.S.* Chester, railway to Northwich, straight lines joining Northwich, Sandbach, Newport, Oswestry, Wrexham and Chester.

Area X.—*No. 2 F.T.S., No. 3 F.T.S., C.F.S., R.A.F. College*. Lincoln, railway to Boston, straight line Holbeach to Murrow Junction, railway to March, straight lines joining March, Huntingdon, Finedon, Market Harborough, Houghton-on-the-Hill, Melton Mowbray, Loughborough, railway via Nottingham, Mansfield, Tuxford to Lincoln.

Area Y.—*A. & A.E.E., M.A.E.E.* Straight line joining Colchester, Bury St. Edmunds, Southwold, thence round coast to Colchester.

Area Z.—*Headquarters Coastal Area, Gosport; S. of N.C., Lee-on-the-Solent*. Straight lines joining Hamble, Wimborne Minster, St. Alban's Head, Hurst Castle, Gosport and Hamble.

Cloud-flying may be undertaken on any day of the week by the Royal Aircraft Establishment and by the Meteorological Flight, Duxford.



Air photography

WE have received from H. Hemming & Partners, Ltd., a reprint of a lecture on "The Use of Air Photography for Surveying and Economic Development" delivered by Major H. Hemming before the Royal Photographic Society on October 31, 1933. Early in his lecture Major Hemming tells us that "The state of mapping in the Empire—in fact, in the world—is in a very serious condition and has not kept abreast of the times." Major Hemming explains that, on the introduction of air photography it was found that besides the valuable topographical detail secured from the photographs, a mass of information relating to the economic possibilities of the area for development purposes was obtained. "An interesting example of the trend of development," says Major Hemming, "is the contract which my company are managing for the Western Mining Corporation for an air survey of 88,000 square miles of gold-bearing territory in Western Australia." The cameras used by Major Hemming's company are of the Williamson "Eagle IV" type, and he explained the installation and operation of this camera from aircraft. He mentioned multi-engined aircraft as being the most suitable for air survey from the point of view of visibility and reliability. Directional wireless has been introduced into Western Australia to assist the survey aircraft. Special wireless is installed on three lorries and in the survey machine, so that it is possible to take bearings on the aeroplane all the time and control its position. Major Hemming tells of useful surveys made in Rhodesia, Iraq, the Rand and Brazil. It seems that infra-red photography will have a very big effect on air photography of the future. Major Hemming gives an interesting example of its application. Two vertical photographs were taken, one on a panchromatic, with a K2 filter, and the other an infra-red. These photographs were taken at precisely the same moment through a ground mist with two cameras strapped together. The infra-red depicted very full detail, which was not shown in the panchromatic picture.

How to do it

DE HAVILLANDS are always showing people how to do things. They started with the "Moth" in the days when nobody could make up their minds what sort of light aircraft was wanted, and they have continued this policy right up to the new four-engined machine which carries practically the same load at about the same speed as the latest high-speed American transport machine, but does it on about half the horse-power. It is not only, however, with aircraft that the company leads, but also in the matter of the literature which they put out about their

aircraft. Their instruction booklets for both their aeroplanes and their engines are perfect examples of how things should be done. The wording is simple so that anybody can look up particular matters of maintenance without wading through redundant phrases. The diagrams at the end of the book are as full as can be desired and are specifically designed to give owners and ground engineers full information on maintenance matters, like rigging and lubrication, as well as details of typical repairs. This latter is a very valuable feature indeed, particularly for use overseas. These books are strongly bound in imitation leather, and, being of a comparatively small size and flexible nature, are easy to carry about. They are also made on the loose-leaf principle so that amendments may be issued and incorporated from time to time. Anyone who wishes to know all about any de Havilland aeroplane or engine cannot afford to be without them.

Empire air day

MR. W. LINDSAY EVERARD, M.P., will open his private aerodrome to the public on Empire Air Day, May 24, and will himself give demonstration flights. Six pilots will probably take part. Mr. Everard's aerodrome is 85 acres in extent. It has a control tower to facilitate night flying, and a beacon light which flashes out the letter "L" in Morse (dot, dash, dot, dot). This can be seen 40 miles away under normal conditions. A mobile floodlight of 750,000 candle-power, mounted on a motor car, illuminates the ground at night.

Memorial service to Zeppelin crews

THE annual Remembrance Service at the grave of the crews of the two German airships which were brought down in flames at Cuffley and Potters Bar, was held on Sunday, February 25, in Potters Bar Churchyard. Over 1,500 people, mostly Germans attended.

Airways publications

MR. T. STANHOPE SPRIGG wishes us to announce that he has no longer any connection with the aeronautical journals formerly owned and published by Airways Publications, Ltd.

Forum Club aviation exhibition

AN aviation exhibition is being held at the Forum Club, Hyde Park Corner, on April 7, 8, 9, and 10. It will comprise models of modern aircraft and many exhibits associated with aviation. The exhibition will be open to non-members of the Club who may obtain ticket vouchers from members. The price of admittance will be 1s. 6d., which will include morning coffee, afternoon tea, or a cocktail.

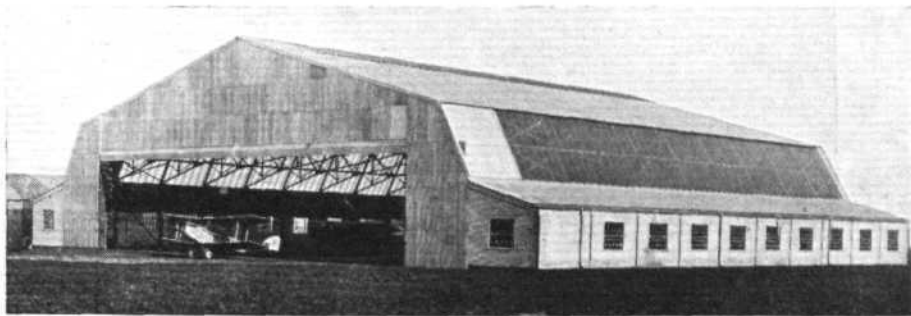
The Industry

Alarms

THERE is one item of aerodrome equipment which, although perhaps small in structure, is nevertheless of the greatest importance; it is not often noticed by the casual observer, and the less it is heard the better, but when it does raise its voice, it is necessary that it should be heard, and heard clearly above the many other noises which float about the air round an aerodrome. Alarms are generally given by means of insistent clanging of bells, or shrieks from an electrical syren; the latter are probably most effective, as they can be heard more easily above the drone or roar of an aero engine. Another quality which these alarms must possess is reliability. When pilots crash, they expect to receive a little immediate sympathy and gentle attention, which they are not going to get if the aerodrome alarm suddenly goes on strike. The fact that the particular alarm was in perfect working order the evening before, functioning with full throat, is not going to interest the pilot much. Perhaps the best known of these alarms are made by Gent & Co., Ltd., of the Faraday Works, Leicester, and 47, Victoria Street, S.W.1. This firm makes several types of alarms, syrens, bells, and horns, all, of course, electrically operated. The Air Ministry use these types of alarms extensively, and they are also supplied to the Sandringham and Balmoral estates.

Cleveland-Discol, an anti-knock fuel

HIGH anti-knock value, improved consumption, better acceleration and better high climbing are some of the properties claimed for the latest alcohol blend fuel which has, jointly, been placed on the market by the Petroleum Storage & Finance Corp., Ltd., and The Distillers' Co., Ltd. This fuel is to be called Cleveland-Discol, and is presumably a modernised version of the Discol which, we believe, was marketed by the Distillers' Co., especially for racing, some few years ago. At a lunch at the Savoy Hotel, the directors of the two companies announced that this fuel was to be sold at the same price as ordinary No. 1 petrols. Neither Dr. W. R. Ormandy nor Mr. Harold Moore would commit themselves to stating the exact octane number of the fuel when we asked them, but we gather that it is claimed to be somewhat better than any other petrol at present marketed. If that is the case, the percentage of alcohol must be between 15 and 20, and as this is entirely



A GOOD HANGAR: This spacious hangar with a main span of 130 ft., a door opening of 100 ft., and a door height of 20 ft., has been built for Gravesend Aviation, Ltd., by A. & A. J. Law, Ltd., of 132, Kingston Road, Merton, S.W.19. As can be seen, provision is made for offices and workshops at either side. The hangar is large enough to accommodate several of the three-engined K.L.M. Fokkers which often land at Gravesend when the weather is too bad at Croydon.

produced in the United Kingdom, marketing this fuel should benefit workmen at home quite a lot. Technicalities were not gone into to any great extent at the lunch, unfortunately, and we were not therefore able to find out whether certain troubles, known to exist when using alcohol, as, for example, corrosion and detrimental solvent action on pipe jointings, and the like, have been overcome. Another trouble experienced in the past is the separating out of the alcohol, but we imagine these and other troubles are not likely to bother motorists, for whom the fuel has especially been produced.

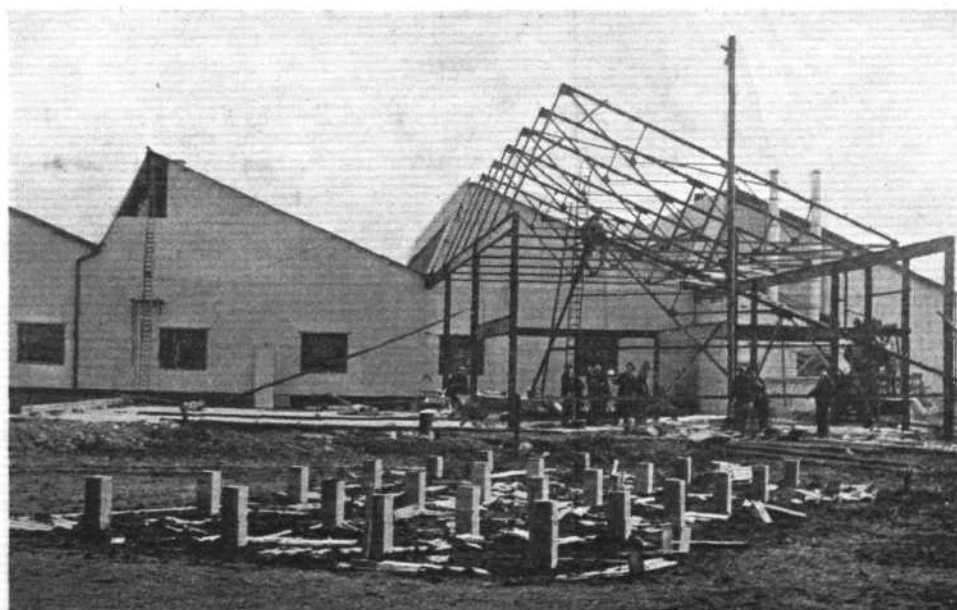
Vickers, Ltd.

THE Directors of Vickers, Ltd., give notice that the following final dividends for the half-year ended December 31, 1933, will be paid to the holders of the preferred stock and preference shares of the company who are registered in the books of the company on Saturday, March 3, 1934:— $2\frac{1}{2}$ per cent. on the preferred 5 per cent. stock (less income tax); $2\frac{1}{2}$ per cent. on the 5 per cent. preference shares (less income tax); $2\frac{1}{2}$ per cent. on the cumulative preference shares (free of income tax). Payment will be made on March 29, 1934. The registers of members relating to these issues will be closed from Monday, March 5, to Saturday, March 10, 1934, inclusive.

A quick overhaul

ROLLASON AIRCRAFT SERVICES recently carried out a complete overhaul for C. of A. of a "Moth" ("Cirrus II") for Wrightson & Pearce, of Heston, in the exceedingly short time of five days.

Under the direction of Mr. Rollason, this firm, in their workshops at Croydon, are making a speciality of rapid and carefully carried out work. At the present time they have machines of many different types being overhauled and modified. One which we saw was the original Desoutter Mark II, G-AAZI. This well-known machine has now been fitted with Triplex glass throughout, "Doughnut" tyres, and many other refinements, and has been sold to Mr. R. Ince.



EXPANSION: Increasing activity at the home of Airspeed, Ltd., at Portsmouth is shown here by the extensions to the present buildings now in progress. (FLIGHT Photo.)



FOR SHORT-WAVE WIRELESS TESTS: Marconi Type A.D. 43A transmitter installed in a Bristol "Bulldog" single-seater fighter for recent short-wave tests between the Marconi experimental station at Croydon and the aeroplane in flight over the Bristol district. The corresponding receiver, Type A.D. 44A, is mounted at the back of the transmitter. This photograph shows the method of installation, the aerial system, and the Marconi-Stanley one-horse-power engine and flexible drive used for running up the generator on the ground for testing and adjusting purposes.

"Aluminium Sections"

A VARIETY of uses for aluminium of angle, bar, channel and numerous other sections is immediately suggested on glancing through the booklet "Aluminium Sections," which has just been produced by the British Aluminium Co., Ltd., of Adelaide House, King William Street, E.C.4. These extruded profiles, which usually are made in pure metal of soft temper, show a strength of five to six tons per square inch. In this condition they are easily shaped to the required form. If greater strength is required, smaller sections may be work-hardened by a subsequent drawing process.

For rapid servicing

EVERYONE knows that pang of economical conscience which assails the pilot while having his oil supply replenished from the small oil cans. He always feels that he loses a good deal of oil in each can if he hurries the

mechanic when pouring it out. The idea of bulk storage, therefore, found great favour where it was installed but that also has its difficulties. It has been found that the wastage is large both when filling large containers and also when carrying the oil from the bulk supply to the machine.

Alexander Duckham & Co., Ltd., the makers of "Adcol" lubricating oils, whose N.P.5 oil is widely used for aero engine lubrication, have now evolved a very neat form of portable pump which can be wheeled up to the aeroplane so that the oil can be pumped direct into the oil tank or sump. This pump has the great advantage that its source of supply is the ordinary ten-gallon oil drum of commerce. One of these drums is carried on the sort of wheelbarrow base of the pump and can be changed for a full drum in a few seconds when necessary. This makes a light and easily handled method of oil supply, which has already proved its advantages to users at many aerodromes.



BRIEFLY

Cirrus-Hermes.—At the end of last month Cirrus-Hermes, Ltd., transferred their activities to Brough, East Yorks. For the future, therefore, all correspondence should be addressed to Cirrus-Hermes, Brough Aerodrome, Brough, East Yorks.

American Instruments.—We have received from the Kollsman Instrument Company, Inc., of 1, Junius Street, Brooklyn, New York, a catalogue of the instruments produced by the company for use in aircraft. These include altimeters, level flight indicators, air speed indicators, tachometers, compasses, gauges and thermometers.

A Lodge Success.—Lodge Plugs were used in the "Gipsy Major" engines of the De Havilland "Dragon" in which M. Robert Germain, M. Descamps and M. Pierre Laveaux recently made the first successful flight across the Sahara from Algiers to Lake Chad.

Clacton Landing Ground.—A new fence on the south-west boundary of the landing area has reduced the run north-east south-west to 343 yd.

Insurance.—We have received a brochure giving details of a very interesting and unusually comprehensive insurance scheme which has been compiled by Mr. C. Biard and R. H. Stocken, of 18, Regent Street, London, together with the Manufacturers' Life Insurance Co., British Aviation Insurance Co. and the Employers' Liability Assurance Corporation. This should certainly satisfy those officers in the R.A.F. who like to pay one premium for all of their cover.

Chamier Gilbert-Lodge Insurance Department.—Under the direction of Air Commodore C. J. A. Chamier this company has now opened an insurance department which covers every form of risk. A booklet fully explaining the advantages to be gained by placing insurance through a broker has been issued by the company.

A Recovery.—Mr. W. D. Campbell, whose illness in Cairo we reported at the time of the Oases Meeting in Egypt, is now fit again. He left for New York early this week. After recuperating from his severe illness in Luxor and Aswan, he visited Nairobi, travelling by Imperial Airways, before returning to England.

Maj. Mealing's Marriage.—Maj. R. H. S. Mealing is, despite his accident, being married at Twickenham to-day (Thursday, March 1). After the ceremony—on a stretcher—he will return to his bed, to which he will have to keep for some months. We offer him our best wishes for his future happiness and a speedy recovery.

Phillips & Powis and "Cirrus" Engines.—Phillips & Powis, Ltd., of Reading, have acquired the manufacturing rights of the "Cirrus II" and "Cirrus III" engines, and have taken over all stock, jigs, patterns, drawings, spares, etc., relating to these engines.

A Comper Recruit.—Mr. G. A. Lingham, who was formerly with Maj. Jack Savage ("Sky-Writing"), has now joined the Comper Aircraft Co., Ltd., as Sales Manager.

A Well-earned Rest.—The many friends of Mr. T. W. Graham, Advertising Manager of the Vacuum Oil Company, will learn with regret that he has been compelled, for reasons of health, to leave business for three months.

British Dope for Central Europe.—We learn from Cellon, Ltd., of Upper Ham Road, Kingston-on-Thames, that in the face of keen competition they have succeeded in securing an order for aircraft dope from Bulgaria.

More "Flight" Postcards.—The following have been added to the popular series of FLIGHT, R.F.C., R.N.A.S. and R.A.F. postcards:—Blackburn "Baffin," Blackburn "Perth," Fairey "Seal," Gloster "Gauntlet," Vickers-Supermarine "Scapa," and Westland "Wallace." All these and the others of the series can be obtained from FLIGHT office, 36, Great Queen Street, London, W.C.2.

THE ROYAL AIR FORCE

London Gazette, February 20, 1934

General Duties Branch

J. L. Barker is granted a short service commn. as Acting Pilot Officer on probation with effect from and with seny. of Feb. 6; P/O. on probation H. S. Miles is confirmed in rank (Dec. 8, 1933). The follg. Pilot Officers are promoted to rank of Flying Officer (Jan. 23):—H. Y. Humphreys, D. R. Shore.

Sqdn. Ldr. F. R. Wynne, M.B.E., is placed on half-pay list, scale A, from Jan. 15 to 24 inclusive; Flt. Lt. E. J. Kingston-McCloughry, D.S.O., D.F.C., is placed on half-pay list, scale A, from Jan. 17 to 20 inclusive; Flt. Lt. A. H. H. MacDonald is restored to full pay from half-pay (Jan. 21); Group Capt. G. P. Grenfell, D.S.O., is placed on retired list (Feb. 16); Flt. Lt. G. S. Taylor is placed on retired list (Feb. 20). The short service commns. of the follg. Acting Pilot Officers on probation are terminated on cessation of duty:—J. C. M. Lonsdale (Feb. 4); E. A. House (Feb. 21).

PRINCESS MARY'S ROYAL AIR FORCE NURSING SERVICE

Sister Miss E. W. Hunter, A.R.R.C., is placed on retired list at her own request (Feb. 16).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Group Captain H. L. Reilly, D.S.O., to Reception Depot, West Drayton, 15.2.34, to command, vice G/Capt. A. C. Winter, O.B.E.

Squadron Leaders: C. H. Stilwell, to No. 26 (A.C.) Sqdn., Catterick, 15.2.34, to Command, vice Sqd. Ldr. G. R. A. Deacon, M.C. G. G. Banting, to Special Duty List, 9.2.34, whilst employed with Royal Australian Air Force. H. G. W. Lock, D.F.C., A.F.C., to R.A.F. Depot, Uxbridge, 15.2.34, for Administrative duties with School of Physical Training, vice Sqd. Ldr. E. Thornton.

Flight Lieutenants: R. H. Donkin, to H.Q., Inland Area, Stanmore, 12.2.34. N. H. Fresson, to No. 1 (F.) Sqdn., Tangmere, 29.1.34. C. A. Horn, to H.Q., R.A.F., Halton, 12.2.34. G. F. Whistondale, to No. 54 (F.) Sqdn., Hornchurch, 19.2.34. C. E. Chilton, to Central Flying School, Wittering, 6.2.34. S. G. Connolly, to No. 821 (F.S.R.) Sqdn., Gosport, 16.2.34.

Flying Officers: H. G. Blair, to No. 603 (City of Edinburgh) (B.) Sqdn., Turnhouse, 16.2.34. J. K. Brew, to R.A.F. College, Cranwell, 14.2.34. J. S. Sabine, to No. 47 (B.) Sqdn., Khartoum, Egypt, 31.1.34. J. B. T. Whitehead, to No. 6 (B.) Sqdn., Ismailia, Egypt, 30.1.34. W. R. Beaman, to Central Flying School, Wittering, 15.2.34.



Re-engagement of Airmen

AN Air Ministry Order has been issued amending the procedure to be followed for the recommendation and selection of airmen for re-engagement.

The number of airmen allowed to re-engage in each air force trade is so regulated as to ensure to re-engaged airmen adequate opportunities of promotion to and in N.C.O. rank and of employment in posts of a supervisory character appropriate to their experience and qualifications. The procedure for re-engagement is therefore designed, on the one hand, to select the airmen who show the greatest promise of being suitable for such promotion and, on the other, to ensure to all applicants the most equitable consideration of their claims in competition with other applicants of the same trade and length of service.

Selection will be made on completion of nine years' service, for ex-apprentices and airmen pilots, the latter being treated as a class and not as members of their basic trade, and eight years' service, for other airmen.

Airmen will be assessed for re-engagement under two general heads, service record for four years preceding date of selection for re-engagement



United States air mail

THE policy of the United States Government in ordering Service pilots to fly the Air Mail machines has, so far, proved disastrous. Six U.S. Army pilots have been killed in one week. The latest death was that of a Lieutenant, who, after having been forced down, slipped from his machine into the icy waters of Rockaway Point, Long Island. He was drowned.

French air force increase

THE French Air Force is considering a three-year plan. It is possible that a loan of £12,500,000 will be raised annually for three years, and the Air Force reorganised. General Denain expressed his opinion that thus lost ground might be made up, and the French Air Force brought thoroughly up to date.

Nomenclature of aircraft—"Vincent"

THE official name of the Vickers (G.P.) aircraft to specification 21/33 is "Vincent."

New Soviet amphibian plane

THE Aircraft Research Institute of the Civil Air Service of the U.S.S.R. has just completed the construction of a new amphibian plane, designed by Mr. Shavrov, known as the "Sh-5." It is fitted with two powerful

ROYAL AIR FORCE RESERVE RESERVE OF AIR FORCE OFFICERS

General Duties Branch

M. O'B. S. Barrington is granted a commn. as Pilot Officer in Class AA(ii.) (Feb. 20). The follg. Flying Officers are transferred from Class AA to Class C:—A. V. Harvey (Jan. 11); P. Du Cane (Feb. 21). The follg. Flying Officers are transferred from class AA (ii) to Class C:—J. F. H. Bulman (July 5, 1933); P. Johnson (Feb. 15).

The follg. Flying Officers relinquish their commns. on completion of service:—E. J. Brighton (Nov. 19, 1933); A. A. C. N. Smith (Jan. 20).

F/O. J. L. Barker relinquishes his commn. on appointment to a short service commn. in the R.A.F. (Feb. 6).

Medical Branch

Flt. Lt. M. O'Regan relinquishes his commn. on completion of service (Jan. 4).

SPECIAL RESERVE

General Duties Branch

P. Ruston is granted a commn. as Pilot Officer on probation (Jan. 30); Pilot Officer on probation P. S. Rook is confirmed in rank (Feb. 1).

AUXILIARY AIR FORCE RESERVE OF OFFICERS

General Duties Branch

Flt. Lt. J. M. Leach is granted a commn. as Flt. Lt. in Class A (Feb. 20).

Pilot Officers: H. M. Cox, to No. 8 (B.) Sqdn., Khormaksar, Aden, 1.2.34. P. C. Hilton, to No. 7 (B.) Sqdn., Worthy Down, 12.2.34. A. T. D. Sanders, to No. 57 (B.) Sqdn., Upper Heyford, 12.2.34.

Stores Branch

Wing Commander H. L. Crichton, M.B.E., to H.Q., Western Area, Andover, 14.2.34, for Equipment (Stores) Staff duties, vice Sqd. Ldr. W. Thorne.

Flight Lieutenant B. E. Essex, to Station H.Q., North Weald, 13.2.34.

Flying Officers: H. E. Freeston, to No. 501 (City of Bristol) (B.) Sqdn., Filton, 14.2.34. G. J. Gaynor, to No. 607 (County of Durham) (B.) Sqdn., Usworth, 9.2.34. A. W. Rule, to H.Q., R.A.F., Middle East, Cairo, 28.1.34.

Accountant Branch

Squadron Leader J. H. B. Carson, to Air Armament School, Eastchurch, 14.2.34, for Accountant duties, vice Sqd. Ldr. R. H. Cleverly.

Flying Officer H. D. Nicholson, to Station H.Q., Tangmere, 16.2.34.

Medical Branch

Flight Lieutenants: A. S. Burns, to No. 3 Flying Training School, Grantham, 15.2.34. J. MacC. Kilpatrick, to Central Med. Estab., 15.2.34. G. S. Strachan, to Station H.Q., Duxford, 16.2.34.

Dental Branch

Flight Lieutenant P. J. C. Keane to H.Q., R.A.F., Cranwell, 14.2.34.



and recommendations as to suitability for future service in higher rank rendered over a period of three years prior to selection.

No. 20 Squadron, R.A.F., Old Comrades Association

No. 20 SQUADRON, R.A.F., Old Comrades Association is now in process of formation, and all members of the No. 20 Squadron, R.A.F., France and India, interested in a Reunion Dinner to be held in London in April, are requested to communicate with P. Tame, 36, Clouddale Rd., S.W.17.

55 Squadron (R.F.C. and R.A.F.) Association

THE 16th Annual Reunion Dinner of the above will be held at the Criterion Restaurant (Carnarvon Room—entrance in Jermyn St.), Piccadilly Circus, London, W.1, on Saturday, March 3, at 7.30 for 8 p.m. The price of the dinner to members will be 8s. 6d. and they may bring guests at a charge of 10s. 6d. each. All past members of 55 Squadron who have not received a circular are requested to communicate with the Hon. Treasurer, Capt. L. B. Goodyer, "Nithsdale," 14 Egmont Road, Sutton, Surrey.



Soviet engines, each of 480 h.p., and is capable of carrying fourteen passengers. The plane can be used for air photography, air sowing, arctic expeditions and transport. The "Sh-5," it is claimed, is capable of reaching an altitude of 6,200 m. and a speed of 225 km./hr. and of flying 2,000 km. without landing. The amphibian plane is of mixed construction; the fuselage is in the main of metal and the wings of wood. The plane can be used on land, water, snow and ice.

Famous French airman killed

CAPT. JEAN GRILLOT, a distinguished French airman who fought during the war, was killed at Montlhéry on Sunday, February 25. He was carrying out aerobatics at a height of 2,400 ft. when he collided with another machine flown by Sergeant-Instructor Bennelon, who was also killed. Capt. Grillot was awarded the Military Cross during the war.

Model aeroplane contest

A COMPETITION for Scale Models is being organised in conjunction with the T.M.A.C. Valuable cash prizes will be offered and the decisions will be made by well-known aircraft manufacturers and designers. Full particulars and entry forms may be obtained from the Hon. Secretary, T.M.A.C., 48, Narcissus Road, Hampstead, or from Air Propaganda, Lincoln Chambers, Banbury, Oxon.

AIR POST STAMPS

By DOUGLAS ARMSTRONG

(Editor of "Stamp Collecting")

An Air Post that Failed

YET another projected British air mail stamp has come very big effect on air photography of the future. with a daily air service to be operated between Portsmouth, Southsea and the Isle of Wight, under the auspices of the Portsmouth, Southsea & Isle of Wight Aviation, Ltd., plans had been made for conveying letters by air over the company's line and special labels provided having a nominal value of 3d. to denote the supplementary fee, in addition to ordinary postage. Printed in blue with a vignette of a Westland "Wessex" machine passing over the Guildhall at Portsmouth, they were to be sold in booklets of twenty for 5s., had not the postal authorities exercised their monopoly, as in the case of Provincial Airways, Ltd., and prohibited the issue.

Air post collectors will be able, however, to include these abortive stamps in their collections, as the unused stock has been acquired by a firm of philatelic dealers. A few sets of colour-trials in blue, green, brown, purple and rose are also known, for which high prices are being asked at present.

Rome—Buenos Aires Flight Stamps

Tragic mementos of the ill-starred attempt made by the Italian airmen, Lombardi and Mazzotti, to fly non-stop from Rome to Buenos Aires last month, which ended disastrously off the Brazilian coast, exist in the form of contemporary 2-lire air mail stamps of Italy in the design showing a flight of arrows against a dark sky, printed in contrasting colours and overprinted with an aeroplane device surmounting the three line inscription, "Primo Volo Diretto Roma-Buenos Ayres-Trimotore Lombardi-Mazzotti," together with the date, "1934," and a tiny Fascist emblem obliterating the original figure of value. They comprise 2 L. on 2 lire yellow (for newspapers), 3 L. on 2 L. olive-green (for postcards), 5 L. on 2 L. rose (for letters of 5 grammes) and 10 L. on 2 L. violet (for heavier letters), and were on sale only from January 15 to January 26 last, when the unlucky flight commenced. Similar special issues were created by overprinting the air mail stamps of Tripolitania and Cyrenaica, the Italian possessions in North Africa.

Germany's Latest Air Stamps

From Germany comes this month a striking new series of air mail stamps ranging in value from 5 Rpf. to 3 Rmk. and embodying so far as the denominations from 5 to 100 Rpf. are concerned, a design by Herr Bastanier



showing an eagle encircling a globe illuminated by the rays of a sun upon which the Nazi emblem of the "Hakenkreuz" is superimposed. Upon the 2 Rmk., printed in green and black, Germany pays tribute to the pioneer work of Otto Lilienthal, inventor of one of the earliest gliders, whilst the highest value, 3 Rmk. blue and black, portrays Count Zeppelin and his famous airship.

New Stamps from the Congo

The Belgian Congo sends us this month her third and most picturesque series of air post stamps most effectively engraved and printed by the State Printing Office at Malines, with a handsome vignette of an aeroplane of the Sabena line following the course of the Congo with mails from Leopoldville for the interior. The denominations and colours of these new stamps are 50 centimes black, 1 fr. rose, 1.50 fr. green, 3 fr. purple-brown, 4.50 fr. blue, 5 fr. red-brown, 15 fr. deep lilac, 30 fr. brown and 50 fr. violet. This was one of the first countries to introduce distinctive stamps for aerial postage in July, 1920, additional values being issued as a result of the extension of the service some ten years later.

Unauthorised Canadian Vignettes

In our January notes reference was made to certain air mail "etiquettes" alleged to have been issued by Canadian Airways, Ltd., and employed in connection with their service to the new goldfields. Mr. W. B. Burchall, publicity manager for Canadian Airways, Ltd., informs us that these "stickers" were neither provided nor recognised by his firm, but are the ingenious invention of an American stamp dealer who had them printed by a design based on that which has been used for several years by the Canadian Airways on certain of their envelopes. He offered a supply to Canadian Airways, but the offer was declined. Apparently he contrived to get a few passed through the post, and is now endeavouring to sell them to English air post collectors as genuine Canadian Airways vignettes at 50 cents each. We are glad to publish this disclaimer and warning, as we ourselves were taken in by the apparent authenticity of these bogus "stickers."

PUBLICATIONS RECEIVED

Aeronautical Research Committee Reports and Memoranda, No. 1551. *The Radially Braced Airship Ring*. By Prof. L. Bairstow. March, 1933. Price 1s. 6d. net. No. 1559. *Use of Networks to Introduce Turbulence into a Wind Tunnel*. By E. Ower and R. Warden. July, 1933. Price 6d. net. No. 1561. *Flow Near a Wing which Starts Suddenly from Rest and then Stalls*. By Aeronautics Laboratory, Cambridge. Aug., 1933. Price 1s. net. No. 1560. *Heat Transmission through Circular, Square and Rectangular Pipes*. By A. Bailey and W. F. Cope. May, 1933. Price 9d. net. London: H.M. Stationery Office, W.C.2.

2nd International Egyptian Aviation Meeting, Cairo, December 18-24, 1933. Aero Club of Egypt. Details of the Organization and Results of the Contests. The Royal Aero Club, 119, Piccadilly, London, W.1.

The Nickel Bulletin. No. 2. Vol. 7. Feb., 1934. The Mond Nickel Co., Ltd., Thames House, Millbank, London, S.W.1.

Imperial Airways Gazette No. 2. Vol. 6. Feb., 1934. Imperial Airways, Ltd., Airway Terminus, Victoria Station, London, S.W. 1.

First annual "Skybird League" club rally

THE First Annual Club Rally of the "Skybird League" and competition for Scale Model Aircraft has been arranged in co-operation with Messrs. Hamleys, of Regent Street, whose directors have kindly offered to give the space at their Regent Street store from March 26 until April 14. Full particulars are being sent to all club leaders. A handsome silver cup and other prizes will be offered for annual competition, and this will be held by the winning club for one year. Cash prizes will also be awarded, and these will go to the assistance of club funds. Capt. W. E. Johns has kindly consented to assist in the judging.

Northern Heights model flying club

LAST year the Northern Heights Model Flying Club held a very successful meeting at the Fairey Aerodrome, over 250 models attending. It is intended to hold another meeting this year on Sunday, July 8, and by kind permission of Mr. C. R. Fairey, the same aerodrome will be used. Some excellent prizes are promised. There will be an Inter-Club team contest, a figure of eight steering contest, a Concours d'Elegance and a snapshot competition. It is hoped that about 1,000 people directly or indirectly interested in models will be present. Further particulars will be sent on application to Charles Rippon, Hon. Organiser, Northern Heights Gala Day, 5, Glasslyn Road, Crouch End, N.8.

NEW COMPANY REGISTERED

BRICO (COVENTRY), LTD., Brico Works, Holbrook Lane, Coventry. Capital, £100, in £1 shares. Manufacturers of and dealers in all kinds of parts and accessories for motor vehicles, motor cycles, aeroplanes, airships and motor boats; engines and machinery of all kinds, general and motor engineers, etc.

PATENT AERONAUTICAL SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors. (The numbers in brackets are those under which the Specification will be printed and abridged, etc.)

APPLIED FOR IN 1932

Published March 1, 1934

- 12,010. Soc. ANON. A. SAURER. I.c. engines of direct-injection compression-ignition type. (405,272.)
30,721. J. P. JENKINS. Toy aeroplanes. (405,423.)

APPLIED FOR IN 1933

Published March 1, 1934

- 5,936. S. KLUTSCHAREFF. Auxiliary tube for screw propeller. (405,469.)
15,695. P. SCHILOVSKY. Air-driven gyroscopes. (405,513.)
18,557. H. NISHI. Arrangements for starting flight requiring no gliding. (405,539.)
22,410. SIEMENS & HALSKE ART-GES. Cooling-apparatus for i.c. engines in flying-machines. (405,561.)